MALARIA ACTION PROGRAMME BASED ON EXPERT COMMITTEE REPORT-1995

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NATIONAL MALARIA ERADICATION PROGRAMME
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MALARIA

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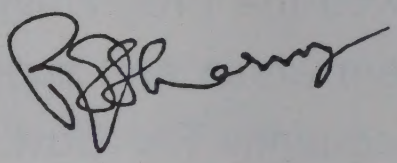
PREFACE

Malaria, the disease of antiquity, was responsible for about 75 million cases every year with 0.8 million deaths during pre-eradication era. The launching of the single largest health programme in the world in 1958 paid back quick dividends by bringing down the cases to one lakh with no deaths within six years of implementation of NMEP. The saga of success and failure of the programme during the last four decades is well known to every one. Though the annual incidence has stabilised around 2 million cases during the last one decade, the country witnessed sudden upsurge of malaria epidemics during 1994 in Rajasthan, Manipur, Nagaland and a few other states with four fold increase in malaria deaths. The Hon'ble Prime Minister of India reviewed the Programme and advised to identify the problem areas and suggest specific control strategy. Subsequently The Govt. of India appointed an Expert Committee on Malaria which submitted its report on 27th February 1995. Based on the report of the Expert Committee, which is included in this document, the Directorate of NMEP has prepared the revised strategy. It is envisaged that the State Health Authorities will reorient the health organisation conforming with the revised strategy taking into consideration the new epidemiological parameters for accelerating the programme activities

in different malaria paradigms especially the hardcore tribal areas, epidemic prone areas, developmental project areas and problematic urban agglomerations. I sincerely look forward for the total commitment of all echelons from the grassroots level worker to the tip of the health hierarchial pyramid in achieving the goal of 'Freedom from Malaria'. I record my sincere thanks to Dr. G.K. Sharma, former Director of NMEP and Shri C. Krishna Rao former Deputy Director of NMEP for assisting me in the preparation of the present document. I also express my grateful thanks to Shri M.S. Dayal, Secretary to Govt. of India, Min. of Health and Family Welfare, Dr. A.K. Mukherjee, Director General of Health Services and Dr. S. Pattanayak, Chairman, Expert Committee on Malaria-1995 for their constant encouragement and guidance in this endeavour.



(Dr. R.S. Sharma)
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1st. March 1995.
Delhi-110 054.

MALARIA ACTION PROGRAMME BASED ON EXPERT COMMITTEE REPORT-1995

EXECUTIVE SUMMARY

Following the resurgence of malaria in 1994, Govt. of India appointed a committee of experts to identify the worst affected malarious areas and suggest specific remedial measures. To fulfill the task as per the terms of reference, the Committee has reviewed the information available at the Dte. NMEP as well as the data collected by the Member Secretary during his field visit to North - Eastern States, data from other States and relevant documents pertaining to the Programme.

At the outset the Committee is constrained to place on record its strong disappointment regarding tardy implementation of the programme by the State Health Organisations.

The Committee observes that though appropriate technology for control of malaria is available for different epidemiological paradigms of Malaria, the administrative indifference, the organisational weakness, the low prioritisation to malaria under the health services and apathy of middle level and pe-

ripheral workers in the States have led to periodic epidemics and high mortality.

To identify the worst affected areas the Committee has developed parameters and through application of these parameters four areas have been identified as high risk areas. These areas are the **epidemic prone areas** covering about 141 million population living in Punjab, Haryana, Western Uttar Pradesh, Rajasthan, Madhya Pradesh and a few pockets in other States. All the **tribal areas** in seven North-Eastern States and tribal areas in 87 districts in seven States in the peninsular India comprising of 69 million population are also the worst affected areas. With the rapid urbanization and industrialization many **projects** have come up both for irrigation and industries which could also be classified as worst affected areas because of influx of large number of susceptible population and different strains of parasite into areas where malariogenic conditions have been created due to projects. The Committee could not identify, due to shortage of time, the exact number of projects which are worst affected and it has suggested that Dte. NMEP may apply the parameters developed by the Committee to categorise them as high, moderate and low risk areas. The Committee has reviewed urban malaria situation and identified twenty nine worst affected cities/towns contributing over 80% of **Urban Malaria** problem.

The Committee's first concern is to save the precious lives of those suffering from malaria for which it has recommended establishment of **Drug Distribution Centres (DDCs) and Fever Treatment Depots (FTDs)** in the

affected areas where health infrastructure is grossly deficient. It has also recommended deployment of **link workers** between the Govt. Organisation and the FTDs / DDCs.

These agencies should be on voluntary basis except to compensate the cost of travel. The Committee estimates requirement of 2,10,000 FTDs/DDCs holders and among them 70,000 Link Workers are to be identified. The Committee is concerned with growing trend of drug resistance of ***P. falciparum*** to commonly used antimalarials. However, the Committee feels that **chloroquine shall continue to be the drug of choice** with the DDCs and FTDs and Link Workers. Under the guidance of MPWs they could administer Primaquine tablets. In addition to these, the Committee strongly recommends that **Quinine tablets and Quinine injectable** should be made available with the PHCs as second line of treatment in areas showing high resistance of ***P. falciparum*** to chloroquine. The Committee estimates that 420 million Choloroquine tablets (150 mg. base), 6.5 million (2.5 mg. base) and 15 million (7.5 mg. base) Primaquine tablets, 2.0 million Quinine tablets (300 mg. base) and 1.0 million Quinine injectable (600 mg. base) will be required for the entire country.

Emphasis on **microscopic diagnosis** cannot be underestimated, since the cost of treatment of malaria cases would go up by 4 to 5 times as compared to microscopically diagnosed and appropriately treated malaria cases. About 22,000 microscopes, @ one

microscope per PHC, are required in the programme. Under the Modified Plan of Operation (MPO) the laboratory services have been decentralized to Block level PHCs, but with the creation of many mini PHCs, both microscopes and microscopists will be required. It is estimated that on priority basis 12,200 microscopes should be procured and trained microscopists should be posted.

Management of complicated malaria cases needs proper attention and priority and the PHC doctors should be trained in the management and treatment of severe and complicated cases. The paramedical workers should be trained in the identification of patients requiring referral facilities.

The Committee has reviewed the status of resistance of vectors to insecticides in the worst affected areas and considers that **DDT will be the choice of insecticide** in many areas and BHC and Malathion could be used in single and double resistant areas respectively. Use of BHC should be discouraged and phased out by 1997. In triple resistant areas, focal spray with synthetic pyrethroids would be necessary. It does not recommend repeated use of synthetic pyrethroids since it considers this should be reserved as a powerful tool for epidemic management. High cost and risk of development of resistance preclude its repeated use. The Committee estimates 11,600 MTs of DDT 50%, 9,000 MTs of BHC 50%, 3,645 MTs of Malathion 25%, 20 MTs of Malathion Technical and 252 MTs of Synthetic Pyrethroids would be required. The Committee records its disappointment on

the poor coverage of insecticides where they have been applied under the programme. **Unless insecticidal spray coverage is improved, no beneficial results could be achieved.** The reasons for poor coverage and the remedial measures have been suggested in the report. The Committee has considered the question of use of Lindane as an alternative insecticide but could not recommend its use till such a time the results of special control trials are available, as in the past it has never been used as an insecticide for malaria control.

Since the malaria eradication era, health education has been considered as an essential tool for increasing the acceptance of the programme but unfortunately health education has been conspicuous by its absence. Proper health education will create awareness in the community in these worst affected areas. A fever could be malaria and treatment with appropriate drug at appropriate time would save the human life. This message has not penetrated deeply into these worst affected areas from where deaths have been reported in large numbers during the epidemic phase. Similarly the poor coverage with insecticides is another instance of poor health education, as the community still is not fully aware about the beneficiary impact of the insecticidal spray. The Committee has reviewed the health education proposal jointly developed by the Central Health Education Bureau (CHEB) and Dte. of NMEP which the Committee fully endorses. For many disease control programmes, sizable funds have been

provided for health education activities and the Govt. may consider clubbing of some of these resources as a **package health education programme** particularly for the tribal areas where community leaders and NGOs are the best agencies for conveying health messages.

The influence of **Missionaries** and other **NGOs** would come a long way in helping the programme in the worst affected areas whose services should be fully explored and utilised in the programme. Community participation is indispensable for the control of malaria. It is easy to talk on community participation but difficult to achieve their sincere co-operation. Unless suitable entry points are identified, one cannot get community involvement. A close contact with the community would facilitate for the identification of suitable entry points. The Committee feels that **Missionaries** and **NGOs** will be very useful in this regard.

Though intersectoral co-ordination was envisaged under the MPO, the implementation has been tardy. It is strongly recommended that without intersectoral co-ordination with the Ministries of Education, Communication, Agriculture, Tribal Welfare and other concerned Ministries, desired goals cannot be achieved. It is recommended that both at the Central and State levels there should be a **High Power Board on Malaria** with intersectoral representatives Chaired by the Secretary (Health) at the Centre, Chief Secretary at the State level and Collector at District level. Incidentally it may be pointed

that at the initial stage of MPO a High Power Board was constituted at the National level under the Chairmanship of Secretary of Health.

For effective delivery of malaria programme in the worst affected areas training has to be emphasised for all categories of workers starting with peripheral workers who are in direct contact with the community. Dte. of NMEP has developed a **comprehensive training programme**, which the Committee endorses in full with emphasis to initiate it on priority in the worst affected areas.

To combat focal outbreaks at the district level there should be a **provision of mobile team** equipped with insecticides, spray equipments, spraymen and anti-malarials for immediate containment of outbreaks. These teams should work in co-ordination with the existing mechanism of district set-up.

The requirements of insecticides and drugs have been estimated on the basis of information available with the Dte. of NMEP. The Dte. of NMEP does not have section-wise information on malaria situation which is available only at district level. The estimates of requirement would come down if the section-wise/mini PHC-wise information is analysed. It is not possible for Dte. NMEP alone to collect the information section-wise. The Committee considers this as an essential step since in many instances, all the sections of PHC are not worst affected. The Committee suggests that the State Govts. may be requested to initiate the action for identification of the

worst affected sections in the PHCs. This is the ideal time to collect this information so that proper district-wise planning could be made for procurement of insecticides and drugs well before the transmission season of malaria i.e. April - May, 1995. The concept of bottom-up planning from district to State and to the national level should be promoted.

The Regional Offices of Health & Family Welfare (ROH & FW) of Govt. of India are the vital agencies for monitoring and assisting the State Govts. in the implementation of the programme. The Committee feels that the ROH&FWs have not adequately rendered the assistance in this regard. The Committee strongly pleads that they may be more involved in the district and State planning and to assist the Dte. of NMEP in monitoring and evaluation of the programme.

THE COMMITTEE REITERATES AND STRESSES THE POINT WITH STRONGEST EMPHASIS THAT UNLESS TIMELY REMEDIAL STEPS ARE UNDERTAKEN BY THE HEALTH ADMINISTRATION TO PROVIDE ON SCHEDULE THE FIELD SERVICES OF NMEP TO THE COMMUNITY, THE EPISODES LIKE 1994 WILL BE REPEATED IN FUTURE IN A MORE INTENSIFIED MANNER. THE COMMITTEE SINCERELY HOPES THAT NATIONAL GOVERNMENT WILL PREVAIL UPON THE STATE GOVERNMENTS FOR PROPER IMPLEMENTATION OF THE RECOMMENDATIONS.

The Committee suggests that instead of piecemeal changes in the strategy of malaria control, the Central Government should appoint a team of administrative and technical experts in Planning, Finance, Information, Education & Communication, Epidemiology and Malariology to review the entire malaria problem vis-a-vis health care delivery system in the country.

The Committee expresses its thanks to the Govt. of India for giving an opportunity to review the situation. It also thanks the Officers and Staff of Dte. of NMEP who provided all support to the Committee in undertaking the assignment in a short period of one month.

MALARIA ACTION PROGRAMME BASED ON EXPERT COMMITTEE REPORT-1995

1. INTRODUCTION

The Directorate of National Malaria Eradication Programme (NMEP) under the Directorate General of Health Services, Ministry of Health and Family Welfare, Govt. of India, is the nodal organisation for planning, monitoring, evaluation and providing technical guidelines to the States/Union Territories for control of four communicable diseases i.e. Malaria, Filaria, Japanese encephalitis and Kala-azar. The programme is implemented by the State Health Authorities. The Dte. of NMEP formulates the control strategy and its modification as and when required.

Following the successful implementation of the National Malaria Control Programme (NMCP) during 1953 -1958, the National Malaria Eradication Programme was launched in the year 1958 with the following objective:

"The ending of the transmission of malaria and the elimination of the reservoir of infection in a campaign limited in time and carried to such a degree of perfection that when it comes to an end, there is no resumption of transmission".

The programme achieved near eradication in the year 1965 with one lakh malaria cases and no deaths due to malaria. Subsequently there was resurgence of malaria and malaria incidence reached the peak of 6.4 million cases in 1976.

Consequently the strategy for malaria control programme was changed and Modified Plan of Operation (MPO) was introduced from 1st April, 1977. The objectives of the MPO are:

1. Prevention of deaths due to malaria,

2. Reduction of morbidity due to malaria, and

3. Maintenance of industrial and green revolution due to freedom from malaria as well as retention of achievements gained so far.

With the modified strategy, the malaria incidence came down to about 2 million cases in 1984. Since then the number of malaria cases in the country have stabilised around this figure.

During 1994 there was a sudden upsurge in malaria problem resulting in epidemics in the States of Rajasthan, Manipur and Nagaland; Rajasthan recording about four-fold increase in the deaths due to malaria.

In view of the grave situation, the Hon'ble Prime Minister of India reviewed the Programme on 5th December, 1994 and he advised to constitute a group of experts to identify the problem areas and suggest specific action plan for malaria control. In addition he also advised that the control of malaria in other areas should be strengthened through Primary Health Care system (PHC).

2. CONSTITUTION OF THE EXPERT COMMITTEE

The Expert Committee was constituted by Ministry of Health & F.W. Vide Order No T-14012/1/94-MAL. dated 14/12/94 with the following members:

1.	Dr. S.Pattanayak, Ex-Director, NMEP and former WHO Regional Advisor	-	Chairman
2.	Dr. G.K.Sharma, Ex-Director, NMEP, Ex-Member FIELD-MAL, WHO, GENEVA	-	Member
3.	Dr. R.G.Roy, Ex-Director, CLTRI	-	Member
4.	Dr. K.K.Datta, Director, NICD	-	Member
5.	Dr. V.P.Sharma, Director, MRC	-	Member
6.	Shri N.L.Kalra, Formerly Entomologist/CCO, at NICD and NMEP	-	Member
7.	Dr. (Mrs.) Kuntala Jayaraman, Prof. & Head of Deptt. of Biotech., Anna University, Madras.	-	Member
8.	Dr. R.S.Sharma, Director, NMEP	-	Member Secretary

3. THE TERMS OF REFERENCE OF THE EXPERT COMMITTEE ARE AS UNDER:

1. The committee should identify cities/areas where the problem is at its worst and formulate location specific strategies to tackle the problem.

2. Measures for Health Education should be specifically referred to.

3. To suggest specific strategy/methodology and action plans to be implemented in such areas.

4. The Plan of Action should indicate a specific time frame not exceeding one year for the implementation of the programme, with reasons as to why a particular course of action is proposed.

5. To work out financial implication for additional inputs, if any.

The Expert Committee had five sessions of detailed discussions. Member Secretary also visited one of the hardcore areas i.e. North-Eastern States and had detailed consultations with the Programme Officers and Directors of Health Services. In addition, the Committee examined in depth all the current records available with the Directorate of NMEP, all the recent proposals submitted by them to Min.of H&F.W. and had detailed discussions with the Officers of NMEP.

After these deliberations the Expert Committee has come to the following decisions.

4. THE PROBLEM

The Directorate of NMEP has identified malaria problem areas requiring specific strategies for control. These problem areas are broadly classified as under:

4.1. Hardcore areas (Tribal areas)

Those areas where malaria control operations over the last four decades have failed to contain the disease. Such areas have the following characteristics:

4.1.1. These are mostly difficult terrain areas, and a large part of which becomes inaccessible during monsoon and subsequent flooding.

4.1.2. The population is predominantly ***TRIBAL.***

4.1.3. They have predominantly ***P.falciparum*** infection.

4.1.4. They have stable malaria with transmission period extending up to 9 months or more.

4.1.5. They report bulk of malaria deaths in the country.

These areas comprise of (a). Seven North-Eastern States; (b) Tribal areas of 87 districts in the States of Andhra Pradesh, Bihar, Gujarat, Madhya Pradesh, Maharashtra, Orissa and Rajasthan.

4.2. Epidemic prone areas

High risk areas are considered to be those which are often prone to malaria epidemics. The periodic fulminating malaria epidemics contribute a large number of malaria deaths. North-Western plains, semi-arid climatic zone with annual rainfall up to 100 mm and Indo-Gangetic plains are identified as major epidemic prone areas. During epidemics the malaria deaths in these high risk areas outnumber the malaria deaths reported from the rest of the affected States.

4.3. Project areas

The developmental projects attract a large number of labour populations from endemic areas bringing different strains of malaria parasites as well as non-immune population groups. The prolific increase in vector breeding places and increased man-mosquito contact favour high malaria transmission. These pockets contribute a large number of malaria cases which are highly disproportionate to the relatively small population groups inhabiting these areas. Specific control strategy is required for such areas.

4.4. Triple Insecticide Resistant areas

The ubiquitous rural vector, ***Anopheles culicifacies,*** has become resistant to the conventional insecticides namely DDT, BHC and malathion in the western belt of India specially the northern parts of Maharashtra & Karnataka, and southern parts of Gujarat. In addition there are such pockets of insecticide resistance in other parts of the country. Fortunately only a few pockets in the above triple resistant belt exhibit high risk to malaria. In such identified high risk areas indoor residual spray with synthetic pyrethroids is considered to be a better alternative tool to contain/prevent malaria epidemics.

4.5. Urban areas

The review of past data of Urban Malaria Scheme reveals that the following 15 Cities are accountable for nearly 80% of malaria cases of Urban Malaria Scheme (UMS) of NMEP. For example Madras City alone is responsible for nearly half the malaria cases in Tamil Nadu.

These Cities are:

1. Delhi 2. Madras 3. Calcutta 4. Bombay (including New Bombay) 5. Hyderabad 6. Bangalore 7. Bhopal 8. Ahmedabad 9. Jaipur 10. Lucknow 11. Chandigarh 12. Vadodara 13. Visakhapatnam 14. Vijayawada 15. Kanpur.

In addition to the above 15 major Cities, 14 smaller

Cities/Towns have also been reporting high malaria incidence

The Urban Malaria Problem mainly arises due to the following features:

4.5.1. Unplanned rapid growth of township with prolific increase of slum population.

4.5.2. Transmigratory/floating population from areas including malaria endemic belts coming to urban areas in search of jobs, etc.

4.5.3. Poor water management in respect of both water supply and water disposal.

4.5.4. Civic by-laws for reduction/elimination of domestic and peridomestic mosquito breeding places are either not promulgated or not properly implemented.

4.5.5. Case finding mechanism is either absent or very poor.

4.5.6. Insufficient staff for carrying out antilarval operations which is not augmented with rapid population growth.

The Urban Malaria Scheme will continue in the rest of the towns presently covered under the scheme. New towns fulfilling the criteria of UMS will also be brought under the ambit of the scheme.

5. EPIDEMIOLOGICAL PARAMETERS FOR IDENTIFICATION OF HIGH RISK AREAS IN DIFFERENT PARADIGMS OF MALARIA FOR INSTITUTING SPECIAL LOCALISED CONTROL MEASURES TO PREVENT MALARIA MORTALITY AND REDUCE MORBIDITY

The Expert Committee has reviewed the malaria problem in different paradigms identified by the Directorate of NMEP which have been modified by the Committee into four paradigms namely: (i) Tribal (ii) Epidemic prone (iii) Project and (iv) Urban Malaria. After thorough screening of data and full deliberations, the Expert Committee has formulated the following parameters for identifying worst affected areas in different malaria paradigms. An area should fulfill one or more of the following epidemiological parameters to qualify for implementation of special control measures.

5.1. Rural areas

5.1.1. Recorded deaths due to malaria (on clinical diagnosis or microscopic confirmation of ***P.falciparum*** infection) during the transmission period with evidence of locally acquired infection in an endemic area, during any of the last three years.

5.1.2. The Slide Positivity Rate (SPR) index is to be used for the identification of the areas as follows:

a). Doubling of SPR during the last three years

provided the SPR in second or third year reaches 4% or more.

or

b). Where SPR does not show the doubling trend as above but the average SPR of the last three years is 5% or more.

5.1.3. ***P.falciparum*** proportion is 30% or more provided the SPR is 3% or more during the previous year(s).

5.1.4. An area having a focus of chloroquine resistant ***P.falciparum.*** (A chloroquine resistant PHC will be characterised by detection of more than 25% of R II and R III level cases in a minimum sample of 30 cases), as per WHO recommendations.

5.1.5. Tropical aggregation of labour in project areas.

5.1.6. New settlements in endemic/receptive and vulnerable areas.

5.2. Urban areas

5.2.1. All the15 Cities identified as high risk areas.

5.2.2. Among the remaining cities/towns presently covered under UMS, the SPR 10% and above during any of the last three years. (14 smaller Cities/ Towns have been identified)

5.2.3. Any other urban area with a population of 50,000 or more and SPR more than 5% or the ratio of clinical malaria cases to fever cases more than one third as per hospital/dispensary statistics during the last calendar year.

6. IDENTIFICATION OF AREAS/POPULATION FOR ACTION PLAN

The rough estimates show that intensified measures will have to be implemented in selected PHCs & Sub-Centres (Sections) in the districts recording worsening malaria situation. The population identified is given below:

Population in high risk malarious areas		Pop. in million
i).	Tribal & difficult areas	69
ii).	Epidemic prone areas	141
iii).	Urban areas	45
	Total	**255**

The above urban figure does not include population in those towns which are outside the Urban Malaria Scheme and are not covered by NMEP-MPO under Primary Health Care system. The remaining urban population is nearly 150 million. These areas are to be

delimited and surveillance mechanism will have to be established gradually at a later stage, wherever required.

The Committee has demonstrated the application of qualifying epidemiological parameters in two States namely Assam and Karnataka which are generally classified as difficult terrain and plain areas respectively. The PHC-wise data for the three years (1991-93) revealed that 47 per cent rural population in Assam and 8.4 per cent rural population in Karnataka are in worst affected/high risk areas. The additional staff requirement is given in Appendix 1A, while the additional inputs required for difficult and plain areas are given in Appendix 1B and 1C respectively. Similar exercise for Urban area is given in Appendix 1D.

About 11.62 million population spread in 8 States/ Union Territories have already been brought under alternative drugs (Sulpha + Pyrimethamine combination) where ***P.falciparum*** resistant to chloroquine was detected. The details of areas are given in Appendix-2A. The Expert Committee has developed the qualifying parameters for change of drug. Six additional PHCs with a total population of 10.27 million spreading in five States have been recommended by the Expert Committee for alternative drug (Sulpha + Pyrimethamine) and the names of the PHCs are given in Appendix-2B. Chemoprophylaxis in pregnant women against malaria is given in Appendix-2C.

The malaria high risk cities/towns are given in Appendix-3A, 3B and Model Civic By-Laws are given in Appendix-3C.

7. MALARIA CONTROL STRATEGY IN SPECIFIC AREAS

7.1. Introduction

At the outset, it may be mentioned that the Committee very strongly feels that piecemeal palliative measures to control malaria in worst affected pockets are not going to solve malaria problem by 2000 A.D. The strategy of malaria control for the entire country under the Primary Health Care (PHC) system does not cover urban malaria. Specially those urban areas which do not fall under Urban Malaria Scheme and are without organised malaria control activities, require immediate attention. Therefore, it is felt that a group of experts in public health administration and malaria should look into present malaria control strategy of the country as a whole and formulate a revised approach keeping in view the new trends. Such an exercise should be done on priority but not in haste because it may require considerable infrastructural changes in health organisation as well as administrative and technical approach.

7.1.1. The Expert Committee has considered the revised Global policy for malaria control of the World Health Organisation as brought out at the meeting held at Amsterdam in 1992. The Committee has also discussed the report of the Regional Working Group Meeting held at WHO/SEARO, New Delhi in March 1993.

7.1.2. The Committee is aware that World Bank assistance is being sought by Govt. of India for control of malaria in tribal PHCs of seven peninsular States. The document pertaining to the strategy to be adopted under this project was examined and the Committee fully endorses the same. (Vide Appendix-4) However, since this project is likely to take some time, the Committee suggests that the short term strategy in these areas also should be implemented till the project is launched.

7.2. Taking the view, that **malaria is an exclusively local phenomenon**, the disease prevalence and epidemiological factors vary from area to area, the Committee endorses that approach to malaria control in any area should have the following two main activities.

7.2.1. **Disease management**: Through early diagnosis and prompt treatment (EDPT).

7.2.2. **Selective suitable intervention measures:** These measures should be directed towards transmission interruption/control. There can be anti-adult measures like insecticidal spray, or anti-larval measures with chemical larvicides, biocides and water management to prevent mosquito breeding. Both these measures can be supplemented by personal protection measures to prevent man-mosquito contact.

7.2.3. Chemotherapy: If any area falling under any of the four paradigms given in Table 7.3 and has the problem of chloroquine resistant strain of ***P.falciparum***,

presumptive treatment mentioned in the report should be given with drugs recommended under The Drug Policy of NMEP. ***P.falciparum*** cases should be given R.T. on priority basis within 48 hours.

Adequate quantities of alternative drugs for presumptive and Radical treatment should be stocked. All workers should be trained to administer proper drug schedule.

Adequate stocks of quinine tablets and injectable stocks should be available at referral centres - PHC/ Dispensary/Hospital for treatment of ***P.falciparum*** cases non- responsive to chloroquine.

The alternative antimalarials currently in use in the programme as per the guidelines issued in the Drug Policy of NMEP are considered to be effective in the containment of chloroquine resistant infection. Therefore, the Committee is of the opinion that there is no need to introduce third line of drugs namely Mafloquine, Halofantrine, Artimesinine and its derivatives, etc. at the present juncture in the programme. However, trials should be conducted to evaluate the efficacy of these drugs in ***P.falciparum*** resistant strains for future use.

7.2.4. One of the essential requirements is to have a quick response capability for control of epidemics. This capability should be created at peripheral administrative headquarters i.e. district level. The unit should be fully

equipped to investigate and undertake quick containment measures. Therefore, it is recommended that in the problem districts there should be one mobile malaria control unit with the following component.

Equipment	Staff
I. Vehicle (Van) - 1.	I. Medical Officer - 1
II. Microscopes - 2.	II. Technicians - 2
III. H.C. sprayers - 5.	III. Spraymen - 5
IV. Hand operated micro Discharge fogging machine- - 1. or Automisers - 5.	IV. Insect Collectors - 2
V. Insecticides -as required	V. Driver - 1
VI. Chemicals, drugs, -do- glassware and other equipments	

7.2.5. **High Power Board**: To strengthen malaria control activities in the country, intersectoral co-ordination is essential so that mosquitogenic conditions are not created by different sectors and they actively collaborate to prevent/reduce malariogenic potential in the area. For this purpose there is a need to establish a high power board in malaria at the Centre, State and District levels. These boards are to be chaired by Health Secretary at Centre level, Chief Secretary at State level and Collector at District level which should include senior level repre-

sentatives from the concerned sectors. The implementation of malaria control activities should be reviewed by the board periodically to effect corrective measures.

7.2.6. **Health Education**: The Expert Committee has gone through the proposal on IEC Strategy prepared by Dte.of NMEP in collaboration with CHEB. The Committee is of the view that in the present context, health education should constitute an important adjuvant to malaria control and thus the specific strategy along with its financial implications is appropriate and should be implemented in toto. (See Appendix-5A, 5B and 5C.)

7.2.7. **Training:** The Expert Committee is of the opinion that training of all levels of workers is pivotal to support the implementation of the programme. This is more relevant in the light of malaria control strategy being revised from time to time. The Committee has gone through the training proposal as well as its module along with its financial outlay prepared by the Dte. of NMEP and fully endorses the proposal for its implementation with priority to high risk areas. (See Appendix - 6A & 6B)

7.3 Based on the above principles the strategy recommended by the Committee is given in Table 7.3

It should be clearly understood that the qualifying Epidemiological parameters given under item 5.1 and 5.2 can be applied to a malaria situation in any of the paradigms. Thus the several areas qualifying under a specific criterion may require different control approaches because of inherent differences in malaria epidemiology of each of the paradigms.

Table-7.3 SHORT TERM MALARIA CONTROL MEASURES RECOMMENDED FOR HIGH RISK AREAS IN DIFFERENT PARADIGMS OF MALARIA

S.No.	Malaria Area	Qualifying epidemio-logical parameter	Disease Management	Intervention Measures (if not specified, to be implemented for two consecutive years)
7.3.1.	**#Epidemic prone areas;** Punjab, Haryana, Western U.P., Rajasthan, M.P. and a few pockets in other States (vector ***An. culicifacies***)	5.1	-Case detection and presumptive treat-ment of fever through DDC/FTD/ACD/PCD -Blood side collection & examination -Radical treatment with priority to ***Pf*** cases within 48 hours. **-Action Required** -Infrastructure according to present norm to be placed in position -Each village to have FTD@ 1000 pop. or part thereof if the distance between the villages/hamlets is more than 3 kms. -DDC can be established if FTD is not practicable due to non-availability of suitable local resident to man it. -PHC MO should decide opening of DDC/ FTD according to the local situation -Provide malaria clinics in selected sub-centres away from PHC -Alternative drug in chloroquine resistant ***Pf*** areas. -IEC as per Appendix-5A & 5B	**Short term intervention measures.** -Residual insecticidal spray, 2 rounds with suitable insecticide in selected villages recording high malaria incidence -Implement anti-epidemic measures in case of focal outbreak. -IEC as per Appendix 5A & 5B

Table-7.3 *(Contd).*

S.No.	Malaria Area	Qualifying epidemio-logical parameter	Disease Management	Intervention Measures (if not specified, to be implemented for two consecutive years)
7.3.2	***Tribal Areas:** All the 7 North-Eastern States & Tribal areas of A.P., Bihar, Gujarat, M.P., Maharashtra, Orrisa & Rajasthan.	5.1	-IEC as per Appendix 5A & 5B -Intensified IEC as given in Appendix-5A & 5B -Disease Management as given under 7.3.1. -MPW should be able to identify severe cases of malaria requiring referral to PHC. -PHC should be well equipped to tackle all severe cases of malaria -Alternative drug in chloroquine resistant ***Pf*** areas. **Action Required** Link worker. One for 2000 population. He should also work as FTD and carry all blood Sides of his area to PHC or malaria clinic twice a week. He should also bring replenishment of drugs and microslides for FTDs in his areas. Other actions as given in 7.3.1	**Short term intervention measures** 2 rounds of suitable insecticidal spray in all qualified villages of PHC. -Selective third round in a few villages with epidemic potential (The spray coverage of rooms should not be less than 80% within the spray schedule) Long term intervention measures -Use of impregnated bednets -Chemophrophylaxis to pregnant women -IEC as per Appendix-5A & 5B

#The **epidemic prone paradigm** also includes areas under the vectorial influence of ***An. stephensi*** and ***An. annularis*** besides sibling species of ***An. culicifacies.*** These areas require specific transmission control measures which are detailed in Appendix-7

*The **Tribal paradigm** include areas under the vectorial influence of ***An.minimus, An.fluviatilis, An. culicifacies*** and ***An dirus.*** These areas require specific transmission control measures which are detailed in Appendix-7

Table-7.3 *(Contd).*

S.No.	Malaria Area	Qualifying epidemio-logical parameter	Disease Management	Intervention Measures (if not specified, to be implemented for two consecutive years)
7.3.3	**Project Areas:**	5.1	Mass screening of labour/incoming population should be continuously done if transmigration is frequent. -All incoming persons from high risk tribal areas should be given presumptive treatment along with a single dose of 45 mg Primaquine. -Alternative drug in chloroquine resistant *Pf* areas. **-Action Required** -Additional establishment of infrastructure for malaria surveillance and referral hospital/dispensaries and malaria clinics in all projects -All other measures as given under 7.3.1.	**Short trem Intervention measures** -Anti-larval measures with chemical Larvicides at weekly intervals/Bio-environmental control measures including biocides **-Action Required** -Establish an anti-larval organisation -Residual insecticidal spray 2 rounds in all human dwellings including the transmission period with a suitable insecticide -I.E.C as per Appendix-5

Table-7.3 *(Contd).*

S.No.	Malaria Area	Qualifying epidemio-logical parameter	Disease Management	Intervention Measures (if not specified, to be implemented for two consecutive years)
7.3.4	**Urban Areas:**	5.2 & Any Urban area with 5.1	-active surveillance in slum areas at weekly intervals -Activated passive surveillance in hospitals and dispensaries by providing extra worker to man a malaria post. -Presumptive treatment -Radical treatment with priority to ***Pf*** **-Action Required** -Provide adequate staff for active surveillance in slum areas @ one worker for 20,000 pop. -Establish one malaria clinic for 50,000 population or part thereof: -The location of malaria clinic should be preferably adjoining slum area if possible and wherever feasible its location should be in existing dispensa-ry.	**Short trem Intervention mea-sures** -Anti-laval measures with chemical Larvicides at weekly intervals/Bio-environmental control measures including biocides **-Action Required** -Establish an anti-larval organisation -Residual insecticidal spray 2 rounds in all human dwellings including the transmission period with a suitable insecticide -I.E.C as per Appendix-5

8. JUSTIFICATION FOR ACTIVITIES OF EARLY CASE DETECTION & PROMPT TREATMENT AND TRANSMISSION CONTROL

8.1. Rationale for early case detection & prompt treatment

It is a well known fact that for taking care of the above two activities, it is essential to have an organisation capable of detecting all malaria cases as quickly as possible so that they can be administered proper treatment to prevent mortality and curtail the period of morbidity.

At present the active case detection is carried out by Multipurpose Workers (MPW-male) under the PHC system. This peripheral worker is expected to provide domiciliary services at fortnightly interval. This is an epidemiological necessity in case of malaria and no further justification is needed.

However, in India under the PHC system the post of MPW (male) has been provided at the rate of one for 3000 population in hilly and tribal areas and one for 5000 population in other areas. They do not adhere to the scheduled domiciliary visits because of very low priority to the malaria programme within the overall health activities carried out under the PHC system. Further this manpower in some specific pockets where the population density is very low (like Bastar in M.P. or Koraput in Orissa) is not adequate to cover the difficult areas within

the time schedule.

The blood smear collection and examination are necessary to have parasitic confirmation specially in view of large number of ***P.falciparum*** infections in those areas which require immediate chemotherapeutic intervention to prevent mortality. Therefore, this activity cannot be substituted by any other method. Moreover in these areas there are pockets of drug resistance and alternative drugs are used to treat resistant ***P.falciparum.*** These antimalarials have no action on ***P.vivax*** or ***P.malariae.*** Therefore two antimalarial drugs are to be administered simultaneously if microscopic diagnosis is dispensed with, thus increasing the cost of treatment to 3 to 4 times for each malaria case. Therefore:

8.1.1. It is essential to fill all the vacant posts of MPWs in the country.

8.1.2. A fortnightly domiciliary visit schedule is to be chalked out and strictly adhered to by MPWs.

8.1.3. It may be necessary to strengthen and augment the organisational component in some areas for which the following is suggested:

8.2. Provision of Fever Treatment Depots (FTDs) and Link Workers

FTDs: These are manned by voluntary persons selected from the local residents who will collect the

blood smears in the locality and administer presumptive treatment. In the section on the strategy it has been mentioned that there should be one FTD for 1000 population or part thereof if the villages/hamlets are more than 3 kms apart.

The past experience shows that wherever adequate number of FTDs are provided, initially they work efficiently but as they are not contacted by health worker once in a fortnight regularly due to negligence or vacancy in the post of MPW, the FTD holder looses interest and becomes defunct.

Therefore, it is suggested that a part-time worker may be employed under the organisation exclusively for malaria. A link worker may be provided for a population of 2000/4000. He will also work as FTD in his own village. He will collect the slides twice in a week from the FTDs and also his own and carry them to the malaria clinic/PHC. He will also bring back replenishment of drugs and microslides for distribution to all FTDs of his area. He can be entrusted with RT of positive cases in his area after appropriate training. This will ensure early case detection and presumptive treatment of malaria cases in difficult areas and will be one of the main strategies for preventing malaria mortality. This worker should be given a suitable fixed TA/DA to meet the expenditure incurred by him during the course of his duty.

However, it is also suggested that blood smear collection can be carried out by voluntary workers drawn

from local residents or voluntary agencies operating in the locality and also ANMs, health supervisors at their Hqrs, other Government functionaries such as Anganwadi Workers, Forest Guards, etc.

8.3. Justification for malaria clinic

It is essential to examine the blood smears collected by various agencies expeditiously. Under the current staffing pattern and the PHC system there is a considerable time-lag between collection, examination of blood smears and radical treatment due to long distances between peripheral villages and PHC Hqrs., and also due to inadequacy of staff on account of the vacancy position in the cadre of PHC technician.

It is therefore suggested that the laboratories for the malaria microscopy should be decentralised and brought as near to the community as possible by opening a malaria clinic with laboratory technician in all the PHCs including mini PHCs in difficult terrain.

8.4. Justification for establishing supervisory tier

A suitable augmentation of supervisory tier of laboratory technicians should be created under the PHC system.

8.4.1. This would bring timely supervised blood smear examination facilities nearer to the community.

Thereby the time-lag between blood smear collection, examination and radical treatment will be reduced.

8.4.2. By proper supervision the efficiency of the laboratory technician can be maintained to ensure correct and prompt diagnosis.

8.5. Anti-mosquito measures

8.5.1. Residual insecticidal spray

Under the intervention measures for malaria control, the main activity envisaged is residual insecticidal spray. The number of spray rounds are planned keeping in view the length of the transmission period, the prevalence of parasite species in the locality and the transmission potential of the area. The detailed justification for each round of spray is therefore not required here.

8.5.2. Justification for change of insecticides

Wherever the vector, ***An.culicifacies***, shows triple resistance i.e. resistant to DDT, BHC & Malathion with WHO kit under standard laboratory conditions and there is no impact on local transmission even after complete coverage (i.e. with 80% or above sprayable surface area coverage, spray rounds having been completed within the spray schedules) thereby providing complete insecticidal umbrella during the entire transmission period, the change of insecticide should be considered.

One of the members has strong reservations regarding use of DDT for malaria control on account of its persistence in the environment. However, the Committee is of the opinion that DDT is still the insecticide of choice for malaria control wherever it is effective. Similar opinion has been expressed by WHO also.

i) Resistant to DDT	-	change to Malathion
ii) Resistant to both DDT and Malathion	-	change to Synthetic Pyrethroids.

It has been observed in almost all areas of the country the major vector of malaria i.e. ***An.culicifacies*** is resistant to BHC because of its constant use in agriculture and public health. Thereby BHC has outlived its utility under NMEP. Further in such a situation Lindane is also not recommended because the active agent in both the compounds is same i.e. Gamma isomer.

8.5.3. Special anti-larval measures in semi-arid areas

In semi-arid area the anti-larval operations by biodegradable larvicides are suggested because the vector, ***An.stephensi*** breeds mainly in water storage tanks. The treating of these water bodies at regular intervals will cut transmission. However in certain situations where piped water supply is provided or villages have come up near the canal system which increases the breeding potential of ***An.culicifacies***, one round of insecticidal spray with DDT/Malathion or pyrethroid depending upon the suscep-

tibility status of vector is suggested.

8.5.4. It is suggested that NMEP may carry out insecticidal spray only in human dwellings and **not** in animal/cattle sheds. However, in the mixed dwellings where cattle are tethered in the same dwelling where human beings sleep should be sprayed. This is suggested in view of the fact that.

(i) it will reduce the expenditure on insecticide,

(ii) will ensure better coverage of living rooms in human dwellings, and

(iii) may have technical advantage of diverting vector(s) from human beings to cattle.

8.6. Other salient points of justification for use of residual insecticides :

Residual insecticidal spray if properly done interrupts/reduces transmission in the area of operation during the year of application. It gives quick results within a short period of time, unlike bio-environmental methods where results are perceived only after a lapse of some years of operation. Only organochlorine insecticides like DDT persist in environment indefinitely - but because it is sprayed on the walls and ceiling of the house, its dispersal in the environment is minimal as compared to its agricultural use where it is directly applied to the crop and thus enters the food chain directly. Other groups of insecticides are to a

great extent bio-degradable. The WHO has also recommended that for malaria control use of DDT may be the answer in many countries. Community acceptance can be obtained by appropriate and sustained health education. The desired quality of spray can be achieved by intensified supervision and proper training of field worker, other spray personnel and supervisory staff. Proper financial and administrative support to ensure timely spray as per schedule of spray will ensure reduced transmission. Residual insecticide like DDT is sprayed only twice a year in a house; acceptance and ingress to the house is required only twice in a year, while for anti-larval measures the peri and intradomestic water collections are treated once every week; therefore co-operation of house holder is required 52 times a year which is a much more difficult proposition. The places where residual insecticide is sprayed are more or less permanent and easily recognised, while the number, size and type of water bodies where anti-larval measures are carried out change from season to season and year to year. Thus chances of missing a sizable number of breeding sites are more. The residual insecticide spray is cheaper and easy as compared to anti-larval operations as the per capita ratio of breeding area is much higher in rural areas as compared to urban areas.

8.7. Personal protection measures

In many difficult terrains the indoor residual spray has not yielded the desired results because of poor spray coverage. Even the houses which are sprayed, are often

mud-plastered immediately after the spray. People in many tribal areas sleep outdoors and hence indoor residual spray will be of no use when the vector is exophagous and exophilic. Personal prophylactic measures such as use of impregnated bednets are the effective alternatives for prevention of infection. Synthetic pyrethroid impregnated bednets not only prevent man-mosquito contact but also kill the mosquitoes that come into contact with the net.

8.8. Urban Malaria

For Urban Malaria a few additional inputs have been suggested. Some broad and important facts are given in the report. However, the salient aspects are mentioned below:

8.8.1. Intervention measures

After implementation of Primary Health Care delivery system, some of the small towns are not covered by this organisation. These towns have no organised infrastructure for health care and lastly except for 132 towns in the country, the other urban areas have got no organised anti-larval operations for control of malariogenic conditions, detection and treatment of malaria.

8.8.2. Case detection - with special reference to slum areas

Most of the towns including those which are covered

by anti-larval operations do not have the facility of blood smear collection and treatment of positive cases. They mainly depend on dispensaries/hospitals and private practitioners to deliver such services to the patients suffering from malaria.

It is observed that these facilities mentioned above are far away from slum areas and these areas are deprived of essential case detection and treatment facilities for malaria. They are also economically poor and cannot avail treatment from private practitioners for minor ailments like fever. It is therefore suggested that:

1. Provision of surveillance workers in the urban areas specially to carry out active surveillance in slum areas.

2. Extra surveillance workers may be provided to activate the passive surveillance in dispensaries and hospitals which are under-staffed and have large OPDs to attend.

8.8.3. Examination of blood smears collected from urban population.

At present there is no provision under the Urban Malaria Scheme for this. It is therefore suggested that one malaria clinic per 50,000 population or a part thereof to be established. In urban areas the malaria clinic should be located as near to slum areas as possible.

If the above proposal is agreed to, it will also have the supervisory tier for surveillance workers and laboratory

technicians. However, they will remain under the administrative control of the Municipal Health Organisation/ State Health Organisation as the case may be.

9. RESPONSIBILITIES OF STATE GOVERNMENTS

9.1. The Committee wants to put a word of caution as vehemently as possible i.e. the strategy as laid down above will not give any impact on malaria situation unless and until the organisation, administration and execution at the State and peripheral level are not strengthened which is the exclusive responsibility of State Govt. and unless all anti-malaria services are given to the Community at proper time the impact on malaria morbidity and mortality and transmission will not be achieved.

9.2. It is suggested that DMO/District Health Authorities should continuously monitor the efficiency of case detection and timely intervention measures *vis-a-vis* malaria incidence in the community. They should also look into other factors responsible for increase in transmission potential so that advance planning can be done to prevent resurgence of the disease.

9.3. It has been repeatedly observed at every level that the malaria control activities specially spray operations are not carried out in space and time because of delay in release of funds to the District Malaria Officer. Therefore the State Govt. should ensure that the funds

required for spray operations should be released to the DMO in the beginning of April every year.

9.4. The responsibility of planning & implementation of spray operation should rest with the DMO and should be carried out under his technical and administrative supervision. The Committee has noted with concern that the supervision / implementation of spray in some States/ areas was entrusted to private contractors/NGOs, voluntary groups like students, etc,. The spray conducted by such bodies was found to be technically deficient. Hence the spray operations should be exclusively kept under the purview of DMO.

9.5. The funds earmarked for control of malaria in Municipalities/Corporations under UMS should be released to the respective local bodies by the State.

10. MAJOR RECOMMENDATIONS

A: IDENTIFICATION OF AREAS

1. The Committee recommends the application of criteria developed for the identification of worst affected high risk malarious areas as given under the item 5 of the report.

2. The Committee recommends area specific short term control measures which are given in Table-7.3.

3. The State Governments and the District Health Authorities have to further pinpoint the problem PHCs

alongwith the Sub-Centres (Sections) at high risk of malaria where the revised short term control strategy will be implemented.

B: EARLY CASE DETECTION AND PROMPT TREATMENT

4. The Committee considers prevention of malaria mortality through Early Detection and Prompt Treatment of malaria cases in high risk area as the most important malaria control activity and recommends:

4.1. Establishment of Fever Treatment Depots (FTDs) @ one per thousand population: approximately 2,10,000 FTDs will be required.

4.2. Link Workers @ one per 2000 population in tribal areas and one per 4000 population in plain areas; nearly 70,000 Link Workers are required to be deployed.

4.3. Filling up all posts of MPW (male) in these areas on priority.

4.4. Microscopic diagnosis is delayed in many areas ranging from 15 to 45 days which should be curtailed for facilitating prompt treatment. Therefore, about 12,200 additional microscopes are required for both urban and rural areas in the entire country which should be procured on top priority.

4.5. Trained microscopists should be posted

under decentralisation of activities at mini PHCs and urban malaria clinics.

4.6. The Committee recommends that adequate amounts of tablets of chloroquine, primaquine, alternative drugs and quinine as well as injectable quinine should be stocked in the affected PHCs.

4.7. Management of complicated malaria cases needs proper attention and priority. It is recommeded that the PHC medical officers should be trained in the managment and treatment of severe and complicated malaria cases and similarly paramedical workers should be trained so that they are able to identify patients requiring referral facilities.

4.8. The Committee recommends that there is no need to introduce new generation antimalarials immediately as the drugs presently in use under NMEP Drug Policy are effective in combating the problem of Chloroquine resistant ***P.falciparum***

4.9. The Committee recommends that baseline data on the response of Chloroquine resistant ***P.falciparum*** to new antimalarials should be generated for future guidance.

C: INTERVENTION MEASURES

5.1. As regards the quality of intervention measures, the Committee has noticed that the insecticidal spray was

neither timely nor adequate, showing very little impact on transmission. However, there were many instances where the incidence declined immediately following spray which did not last long. Therefore, the Committee recommends that the spray coverage should not be less than 80 per cent giving protection throughout transmission period.

5.2. The Committee recommends that human dwellings and mixed dwellings should be sprayed and **not** cattle sheds.

5.3. The annual requirements of 11,600 MTs of DDT 50%, 9,000 MTs of BHC 50%, 3,645 MTs of Malathion 25%, 20 MTs of Malathion technical and 252 MTs of synthetic pyrethroids projected by Dte. of NMEP for 1995-96 are considered adequate.

5.4. The Committee has also considered the question of use of Lindane as an alternative insecticide but could not recommend its use till such a time the results of special control trials are available, as in the past it has never been used for malaria control.

5.5. The Committee recommends that in semi-arid areas with water storage practices, anti-larval operations should be the main control measure; supplement with selective indoor residual spray wherever required.

5.6. The Committee recommends that the use of synthetic pyrethroid impregnated bednets should be encouraged in selected areas.

5.7. The Committee recommends that the biocides should be used in peridomestic breeding places and their efficacy should be constantly monitored.

5.8. At the district level there should be a provision of mobile team equipped with insecticides, spray equipment, spraymen and antimalarials for immediate containment of epidemics. These teams should work in co-ordination with the existing mechanism of the district set-up.

D: HEALTH EDUCATION

6.1. The Committee has reviewed the health education programme jointly developed by the Dte. of NMEP and CHEB and fully endorses the same.

6.2. Health Education component should be adequately incorporated in all Malariology training courses.

6.3. The involvement of NGOs and local opinion leaders shall be an integral part of health education strategy.

E: INTERSECTORAL CO-ORDINATION

7. To strengthen malaria control in the country intersectoral co-ordination is essential. Therefore, the Committee recommends that a **High Power Board** on malaria at the Centre, State and District levels should be

formed. This board should include senior level representatives from the concerned sectors to facilitate proper implementation of malaria control programme. The board should be chaired by the Health Secretary at the Centre, Chief Secretary at the State level and Collector at the District level.

F: TRAINING

8. Training of all cadres of malaria staff is an important component starting from the grassroots level. The Committee fully endorses the comprehensive training programme developed by the Dte. of NMEP and sufficient funds should be made available for the same.

G: ADMINISTRATIVE AND OTHERS

9. The State Govts. should ensure that funds required for spray operations should be released to the District Malaria Officer in the beginning of April every year.

10. The spray operations should not be entrusted to private contractors or other voluntary organisations due to technical constraints. The spray operations should be exclusively kept under the purview of District Malaria Officials who will implement the spray programme.

11. Regional Offices of Health and Family Welfare of the Govt. of India should be fully involved in all malaria control activities from training to implementation

and evaluation.

12. A comprehensive review of NMEP is required for periodic independent appraisal to bring out policy changes wherever warranted.

12.1. The Committee recommends that instead of piecemeal changes in the strategy of malaria control the Central Govt. should appoint a team of Administrative & Technical experts in Planning, Finance, IEC, Epidemiology and Malariology to review the entire malaria problem *vis-a-vis* health care delivery system in the country.

12.2. In the rest of the country MPO should continue till a new malaria control approach for the entire country is recommended by an Expert Group.

13. Directorate of NMEP should issue detailed guidelines to the States for implementation of short term control measures recommended by the Committee in high risk areas.

14. The Model Civic by-laws should be adopted and strictly implemented in all towns/cities to reduce/ eliminate domestic and peridomestic mosquitogenic conditions.

15. In NMEP Budget, separate funds should be earmarked for Research. Priority projects to meet the immediate needs of the programme should be identified by Directorate of NMEP, MRC (ICMR) and CSIR in mutual

consultations.

16. Many quarters have observed that malaria morbidity and mortality as reported by NMEP are gross underestimates. Therefore, the Committee recommends that a scientific methodology for correct estimation of malaria morbidity and mortality should be developed.

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Appendix-1 A

REQUIREMENT OF STAFF PER MILLION POPULATION

1.	**FTD Voluntary Workers** @ 1/1000 pop.	1000
2.	**Link Workers** @ 1/2000 pop. @ 1/4000 pop.	 500 250
3.	**Malaria Clinic at Mini PHC** **Lab. Technicians** @ 1/20,000 pop. or @ 1/30,000 pop. Microscopes One per mini PHC	 50$ 33$ 10#
4.	**Senior Lab.Technician** **- Supervisory level** Senior Lab.Techn. @ one for 4 Lab Tech.	 - 10

$ At PHCs/mini PHCs where Lab.Technicians are posted no new post to be created. On an average it is expected that at least 10 to 25 Lab.Technicians are posted for a million population.Therefore this can be deducted from above at No.3.

It is understood that microscopes have been provided to almost all mini PHCs/PHCs in the country under

NMEP/TB/some places leprosy and in PHC strengthening programme. Ten microscopes are suggested as stand-by/ or for those mini PHCs where none has been provided so far.

5. Intervention in rural areas : Seasonal Insecticidal spray

260 workers or 52 squads for 5 months	39,000 man days
* One Supervisor per Squad 52 X 5 months	7,800 man days
* 2 pumps (stirrup) per squad + 25% reserve stock	130 pumps
* 3 buckets (15 litres)	156
* 1 bucket (5 litres)	52
* 1 mug (500 ml.)	52
* Nozzle Tips @ 6 per pump per spray season	800
* Washers @ 3 per pump	400
* Anti-larval staff in semi-arid area	200

Appendix - 1B

STATE: ASSAM

Number of Affected Districts, PHCs and Population during 1991 - 1993

Particulars	Total	Number at high risk for malaria
Districts	23	19
PHCs#	159	67
Population (Rural) (in '000)	19920	9397 (47%)

Erstwhile Block PHCs reporting Malaria Cases

.....contd.

Appendix - 1B *(Contd.)*

Additional Inputs required for intensification of malaria control activities in Assam, a difficult terrain state

S.No.	Name of the post	Norm	Requirement as per norm for 9397000 population	Number in position	Balance to be posted	Annual emoluments per worker (Rs.)	Financial implication per annum Rs. in lacs
1.	FTD Voluntary Worker	@ 1 per 1000 pop	9397	NA	9397	nil	nil
2.	Link Worker	@ 1 per 2000 pop.	4700	Nil	4700	6,000	282.00
3.	Lab.Technician	@ 1 per 20,000 pop.	470	159	311	34,020	105.80
4.	Sr. Lab.Tech.	@ 1 per 4 Lab.Tec.	118		118	42,120	49.70
	Total additional expenditure for Assam						**437.50**

Additional inputs per one million affected population in difficult terrains = Rs. 46.56 lakhs

Appendix - 1 C

STATE: KARNATAKA

Number of Affected Districts, PHCs and Population during 1991-1993

Particulars	Total	Number at high risk for malaria
Districts	20	13
PHCs	1121	86
Population (Rural) (in '000)	39870	3358 (8.4%)

.....contd.

Appendix-1C *(Contd.)*

Additional Inputs required for intensification of malaria control activities in plain area as in Karnataka.

S.No.	Name of the post	Norm	Requirement as per norm for 3358000 population	Number in position	Balance to be posted	Annual emoluments per worker (Rs.)	Financial implication per annum (Rs. in lakhs)
1.	FTD voluntary Worker	@ 1 per 1000 pop	3358	NA	3358	nil	nil
2.	Link Worker	@ 1 per 4000 pop.	840	Nil	840	6,000	50.40
3.	Lab.Technician	@ 1 per one PHC.	86	86	nil	nil	nil
4.	Sr. Lab.Tech.	@ 1 per 4 Lab.Tec.	22	nil	22	42,120	9.27
	Total additional expenditure for Karnataka						**59.67**

Additional inputs per one million affected population in plain areas = Rs. 17.77 lakhs

Presuming that all PHCs have a post of Laboratory Technican and none are vacant. A study has shown that in 1993 out of 1130 posts of Lab. Techn. 75% were vacant. In 1990 only 18% vacancies existed in this cadre.

Appendix -1 D
Delhi
Pop: 8.38 million

Sl.No.	Name of the post	Norm	Requirement as per norm for slums	Annual emoluments per worker	Financial implications (Rs. in lakhs)
1.	Surveillance Worker	@ 1 per 20,000	125	Rs. 22,140	27.68
2.	Laboratory Techn.	@ 1 per 50,000	50	Rs. 34,020	17.01
3.	Laboratory Attendant	@ 1 per 50,000	50	Rs. 22,140	11.07

Additonal expenditure for activated surveillance for one million pop: Rs. 22.30 lakhs

Total pop. to be brought under activated surveillance:

(i) 4 Metro Cities : 30% of the pop: = 11.17 million

(ii) 11 Major Cities : 100% of the pop. = 15.27 million

(iii) 14 Smaller Towns : 100% of the pop. = 2.31 million

Total 28.75 million

Total Additional Expenditure for activated surveillance of 28.75 million pop: = Rs. 641.13 lakhs

Appendix - 2 A

LIST OF DISTRICTS ALREADY BROUGHT UNDER ALTERNATIVE DRUG

Sl. No.	Name of the State	Name of the district	Pop. (in million)
1.	A & N Islands	G.Nicobar L.Andaman	0.04
2.	Assam	Karbi Anglong	0.62
3.	Assam	Nagaon	1.86
4.	Maharashtra	Chandrapur	0.78
5.	Meghalaya	All districts	1.76
6.	Madhya Pradesh	DNK Project Pakanjore	2.12
7.	Orissa	Dhenkenal	1.72
8.	Nagaland	All districts	1.22
9.	Uttar Pradesh	Mirzapur	1.50
		Total	**11.62**

Appendix - 2 B

LIST OF ADDITIONAL PHCS RECOMMENDED FOR ALTERNATIVE DRUG

Sl. No.	Name of the State	Name of the District	Name of the PHC	Year	No. subjects Tested	% R II	% R III	Total Pop. (in 'ooo)
1.	Arunachal Pra.	Tirap	Jairampur	1982	30	20	10	30% 78.4
2.	Gujarat	Panchmahal	Kadana	1993	31	19.4	16.1	35.5% 2642.9
3.	Karnataka	Kolar	Gulur	1992	58	27.6	20.6	48.2% 1699.9
4.	Maharashtra	Raigad	Washi	1991	31	19.3	16.1	35.4% 1496.2
5.	West Bengal	Purulia	Ajodhya Hills	1993	37	13.5	18.9	32.4% 2014.6
6.	West Bengal	Jalpaiguri	Uttar Latabari	1990	32		34.8	34.8% 2342.3
								Total 10274.3
								or
								(10.27 Million)

Appendix - 2 C

CHEMOPROPHYLAXIS IN PREGNANT WOMEN AGAINST MALARIA.

Various studies have indicated that malaria during pregnancy results in high morbidity and mortality not only in the women but also results in low birth weight, still birth, intra-uterine growth retardation and cogenital anomalies. These effects of ***P.faciparum*** malaria have been more pronounced among primigravidae than in multigravidae. The Keonjhar project in Orissa "Chemoprophylaxis for malaria in pregnant women and treatment of febrile episodes in pre-school children" also supported the beneficial role of chemoprophylaxis during pregnancy.

The IX Technical Advisory Committee of the Directorate of NMEP in its meeting on 5-6th October 1993 under the Chairmanship of Director General of Health Services, Govt. Of India recommended chemoprophylaxis for pregnant women in high ***P. falciparum*** areas.

Population in 7 Tribal Districts-	45 million
Population in 7 North-Eastern States-	35 million
Total-	**80 million**

Assuming 4% of population is pregnant i.e 3.2 million chloroquine chemoprophylaxis @ 2 tabs per week would imply 3.2x2x52 = 332.8 million tablets

Financial implication: Price of 1000 tabs in Rs 445/-

332.8 million x Rs. 0.45 = Rs. 149.76 million or Rs. 15 Crores approx. annually.

Mechanism of Distribution

In the rural areas wherever Anganwadis under ICDS scheme are existing, the Anganwadi workers would give weekly 2 tabs of chloroquine to all pregnant women registered with them.

In the urban areas wherever AWs are there, the same would apply but in addition to this all Hospitals/Dispensaries involved in antenatal check up should also provide chemoprophylaxis on registration.

The distribution of chloroquine would be the responsibility of the District Malaria Officer/CMHO.

Appendix-3A

CITIES REQUIRING ACCELERATED URBAN MALARIA SCHEME

Sl.No.	Name of the Town	Population (in lakhs)
1.	Delhi	85.00
2.	Madras	39.75
3.	Calcutta	41.43
4.	Bombay	105.06
5.	Hyderabad	15.00
6.	Bangalore	36.80
7.	Ahmedabad	32.00
8.	Bhopal	9.23
9.	Jaipur	10.05
10.	Lucknow	11.50
11.	Chandigarh	6.40
12.	Vadodara	4.11
13.	Visakhapatnam	3.64
14.	Vijayawada	5.43
15.	Kanpur	18.50
	Total	**423.90**

Appendix-3B

TOWNS/CITIES UNDER URBAN MALARIA SCHEME SHOWING MORE THAN 10% SPR DURING 1991-93 REQUIRING ACCELERATED UMS

Sl.No.	Name of the Town	Population (in lakhs)
1.	Chaibasa (Bihar)	1.00
2.	Bharuch (Gujarat)	1.12
3.	Dohad (Gujarat)	0.56
4.	Godhra (Gujarat)	1.00
5.	Jodhpur (Rajasthan)	5.06
6.	Bharatpur (Rajasthan)	2.05
7.	Bellary (Karnataka)	2.01
8.	Tuticorin (T.N)	0.27
9.	Erode (T.N)	1.73
10.	Dindigal (T.N)	1.19
11.	Rourkela (Orissa)	4.18
12.	Sambalpur (Orissa)	1.80
13.	Nabha (Punjab)	0.49
14.	Dimapur (Nagaland)	0.60
	Total	**23.06**

Appendix 3C

MODEL CIVIC BY-LAWS IN URBAN AREAS

For management of domestic and extra-domestic mosquito breeding places, adoption and enforcement of by-laws for use under Urban Malaria Scheme are framed as under:

Control of malaria and other mosquito borne diseases

Draft provisions suggested under appropriate section/rule prevailing in the State

Application of this provision

1. The State Govt./local authority constituted under any act may be under notification enforce the following provisions to the whole or any part of the State/local authority area.

2. (1) If the provisions have been extended, no person or local authority shall, after such extension:

(a) have, keep, or maintain within such area any collection of standing or flowing water in which mosquitoes breed or are likely to breed, or

(b) cause, permit, or suffer any water within such area to form a collection in which mosquitoes breed

or are likely to breed, unless such collection has been so treated as effectively to prevent such breeding.

(2) The natural presence of mosquito larvae, in any standing or flowing water shall be evidence that mosquitoes are breeding in such water.

Treatment of Mosquito breeding places

3. (1) The Health Officer may, by notice in writing, require the owner or the occupier of any place containing any collection of standing or flowing water in which mosquitoes breed or likely to breed, within such time as may be specified in the notice, not being less than 24 hours, to take such measures with respect to the same, or to treat the same by such physical, chemical or biological method, being measures or a method, as the Health Officer may consider suitable in the circumstances.

(2) If a notice under sub-section (1) is served on the occupier, he shall in the absence of a contract expressed or implied, to the contrary, be entitled to recover from the owner the reasonable expenses incurred by him in taking the measures or adopting the method of treatment, specified in the notice and may deduct the amount of such expenses from the rent which is then or which may thereafter be, due from the owner.

Health Officer's Power in case of default

4. If the person on whom a notice is served under

provision 3 fails or refuses to take the measures, or adopt the method of treatment, specified in the notice within the time specified therein, the Health Officer may himself take such measures or adopt such treatment, specified in the notice within the time specified therein, and recover the cost of doing so from the owner or occupier of the property, as the case may be, in the same manner as if it were a property tax.

Protection of antimosquito works

5. Where, with the object of preventing breeding of mosquitoes in any land or building, the Govt. of any local authority or the occupier at the instance of the Govt. or local authority, (have constituted any works) in such land or building, the owner for the time being as well as the occupier for the time of such land or building shall prevent its being used in any manner which causes, works, or which impairs, or is likely to impair the efficiency.

Prohibition of interference with such works

6. (1) No person shall, without the consent of the Health Officer, interfere with, injure, destroy, or render useless, any work executed or any material or thing placed in under or upon any land or building, by or the orders of the Health Officer with the object of preventing the breeding of mosquitoes therein

(2) Sanction in respect of household cans and other containers:

If the provisions of sub-section(1) are contravened by any person, the Health Officer may re-execute the work or replace the materials or things, as the case may be, and the cost of doing so shall be recovered from such person in the same manner as if it were a property tax.

Section in respect of household and other containers

7. The owner or occupier of any house, building, or shed or land shall not therein keep any bottle, vessel, can or any other container, broken or unbroken, in the manner that it is likely to collect and retain water which may breed mosquitoes.

8. All borrow pits required to be dug in the course of construction and repair of roads, railways, embankments etc. shall be so cut as to ensure that water does not remain stagnant in them. Where possible and practicable the borrow pits shall be left clean, free from debris/sediment and sharp edged and extra expenditure not exceeding 1 per cent of the cost of the earth work in any project may be incurred to achieve this. The bed level of borrow pits drain off by drainage channels connecting one pit with the other till the nearest natural drainage nullah is met with. No person shall create any isolated borrow pit which is likely to cause accumulation of water which may breed mosquitoes.

9. In case of any dispute or difference of opinion in the execution of any antimosquito scheme or in its operation

or any work under these provisions in which the jurisdiction of the Govt. of India, or Govt. of any other State is involved, the mater shall be referred to the Govt. of India for final say in the matter.

10. Powers of Health Staff to enter and inspect the premises

For the purpose of enforcing the provisions, the Health Officer or any of his subordinate not below the rank of Health or Sanitary Inspector may, at all reasonable times, after giving such notice in writing as may appear to him reasonable, enter and inspect any land or building within his jurisdiction and the occupier or the owner as the case may be, of such land or building, shall give all facilities necessary for such entry and inspection, and supply all such information as may be required of him for the purpose aforesaid.

Appendix-4

MALARIA CONTROL IN TRIBAL AREAS IN SEVEN STATES THROUGH WORLD BANK ASSISSTANCE

Problems Relating to Malaria in Tribal Areas

Morbidity and Mortality

0.2 per cent of the population in the entire country suffers from malaria annually. On the contrary 1.5 per cent of the tribal population suffers from malaria. Contribution of malaria by tribal areas has been increasing. In 1984 tribal malaria accounted for 24 per cent of the total cases while in 1990 this figure increased to 36 per cent. The condition is more alarming as far as P. falciparum is concerned as the tribal areas account from 51.7 per cent to 66.1 per cent of total ***P. falciparum*** load of the country.

Contribution of malaria cases by tribals in India (1984-1990)

Year	Total All India	Malaria Tribal Areas	Cases In 000 % of tribal to total	Total All India	P. f cases	
					Tribal Areas In 000	% of Tribal to total
1984	2184	517	23.7	655	373	56.9
1986	1782	574	32.0	638	422	66.1
1988	1855	586	31.6	685	354	51.7
1990	1777	642	36.0	616	363	58.8

On the mortality front it is alarming to observe that 60 per cent of deaths due to malaria are reported from tribal areas.

Preliminary studies conducted in tribal district of Keonjhar, Orissa revealed that nearly six per cent of the pregnant women and eight per cent pre- school children suffer from malaria. ***P. falciparum*** cases in this area constitute 90 per cent of the total malaria cases.

Recent sample surveys by NMEP have brought out another area of concern in the form of asymptomatic cases of malaria as well as its varied clinical picture in the tribal areas of identified seven States. The surveys revealed that 20 per cent of malaria positive blood slides of the mass surveys were from asymptomatic persons thus forming an epidemiologically significant reservoir of infection.

HEALTH CARE DELIVERY SYSTEM

A PHC in tribal area is established for every 20,000 population as compared to 30,000 population in other areas. Similarly a sub-centre in the tribal areas caters to the needs of a population of 3,000 as compared to 5,000 in other areas. Similar is the case in respect of Health Workers etc. This is primarily because of difficult terrain, wide areas, scattered population, poor communication, etc. The Governmental efforts are being supplemented by voluntary organisations in some of the tribal areas. In spite of all these efforts there are occasions when tribals

have no access to organised health care facilities and have to depend on the local practitioners of different systems of medicines including Indian system. It is not uncommon to observe that these tribals have to depend on quacks, traditional healers, faith healers etc. The existing situation calls for an indepth study of the entire health care delivery system in the tribal areas so as to formulate an approach which would ensure easy and timely availability of affordable health care services.

In the field of malaria control operations, the present strategy of Modified Plan of Operation does not address itself to the unique circumstances of tribal areas. It is with this background that for tackling tribal malaria problem a special strategy needs to be formulated. This strategy also requires to envisage tapping of resources from other developmental agencies like agriculture, forest etc. for carrying out some of the antimalaria activities.

Based on available information 635 Primary Health Centres (a tribal PHC is one which has more than 25% tribal population and has recorded more than two cases per year per thousand population during the last five years) in 87 districts of the States of Andhra Pradesh, Bihar, Gujarat, Madhya Pradesh, Maharashtra, Orissa and Rajasthan have been identified as high malaria transmission areas.

Malaria being a focal disease calls for formulation of control strategies to be introduced at PHC level which should work upwards through to the district level. This has

also been emphasised by the Technical Advisory Committee (TAC) and Central Council of Health (CCH) who have clearly recommended involvement of districts and Primary Health Centres (PHC) in the process of planning and implementing strategies for the control of malaria.

It is proposed to carry an indepth analysis of the existing scenario of tribal malaria,an assessment of the primary health care and beneficiary needs, the operational aspects of various malaria control strategies and reinforcing the knowledge and skills of the planners and implementers of the malaria control programme.The malaria control efforts till now are formulated at the Centre and the district and PHC are the passive implementers of the antimalaria activities and the community being the recipient without being involved in the process.In this project the community will be actively involved by participating in giving their priorities and the methods they think are best for malaria control.This will be accomplished by a KAP study which includes participant observation approach.

These studies and the training will lead to preparation of a viable, feasible, sustainable plan which will be based on community approach. This plan of operation will be implemented in the sample PHCs selected out of 87 districts of the identified seven States. After testing this plan of operation in the field for about 1 year, a comprehensive plan for all the tribal districts of the identified states shall be prepared for World Bank financing. For all

these activities it is proposed to utilise Japanese grant support.

The **objectives proposed** to be achieved are:

1. To assess health needs/ demands of the community as well as to undertake an indepth analysis of available health infrastructure and operational aspects of various components of NMEP in the identified areas.

2. To impart latest knowledge, skills etc. relating to NMEP to the State level officers with specific reference to District Malaria Officers (DMOs) so as to enhance their technical and administrative capabilities in combating the problem of malaria and getting community involvement in these areas.

3. To formulate a comprehensive, realistic, flexible, viable and cost effective plan adopted to local conditions and needs and involves community, for World Bank financing for control of malaria in the tribal areas ensuring that the formulated plan in the long run is sustainable with the State resources.

The States which have been identified for special inputs for this project for control of malaria are Andhra Pradesh, Bihar, Gujarat, Madhya Pradesh, Maharashtra, Orissa and Rajasthan. These seven States have 87 tribal districts covered by about 635 PHCs which are catering to a population of 44.2 million.

STRATEGIES AND ACTIVITIES

Component 1. Studies.

ASSESSMENT OF THE PRIMARY HEALTH CARE AND BENEFICIARY NEEDS

The health demands/felt needs of the beneficiaries will be studied by KAP survey .The KAP survey will help in assessing the quality of life,the felt morbidity by the community,and their behaviour in utilizing the primary health care facilities besides providing the baseline data.A standardized format (Living Standards Measure Survey - World Bank) will be partially used to assess the quality of life of the community.The study will identify socio-economic and other relevant characteristics of beneficiaries, their health related behaviour as well as knowledge, attitude and social norms having an impact on the relevant aspects of malaria control programme.

The representatives of the community and providers are proposed to be encouraged to identify the realistic field problems relating to all aspects including infrastructure and identify the gaps faced by them while implementing malaria programme.Community ideas on health issues, constraints in getting health care and the possible suggestions on alternatives will be studied by participant observation activity.

Primary health care infrastructure will be studied by

preparing an inventory of the delivery system and the gaps will be identified at the district and PHC level.

These studies are proposed to be conducted by institutions having specialisation for such type of studies and are contemplated to be completed in about three months.The institutions will work along with the health staff of the district and PHC.

Component 2. Training

a) Preparation of a training capsule for planning skills for malaria control at District level and reviewing of the capsule

Preparation of a training capsule imbibing planning process required for control of malaria has been construed as the first component. The training capsule giving recent planning strategies for control of malaria at district level including how to get community involvement will be made by the Directorate of NMEP. It would include all the components of planning with specific reference to planning of control activities for malaria and community involvement. This training capsule will then be sent for expert views to seven Resource Persons having a background of Public Health, as well as planning of national health programmes. After the training capsule has been reviewed by the experts their observations will be discussed in a one day meeting at NMEP headquarters. After detailed deliberations covering all aspects, the draft

training capsule will be given a final shape. This document will give a broad framework of planning, programming, implementing and evaluating various activities pertaining to the national malaria control programme with specific reference to the district level management. All these activities will be completed in about one month.

b) Briefing of all the district malaria/health officers of the tribal districts of 7 States

This activity would involve holding of two days workshop for the district malaria/health officers of the tribal districts. State programme officers, Directors of Health Services, Health Secretaries of the States, staff of NMEP, Regional Directors and the experts who have prepared the training capsule shall be the resource persons. The district malaria officers will be briefed on the recent advances and changes in epidemiological scenario and potential for community involvement in control of malaria. The knowledge & skills imbibed in the recent Global Malaria Control Strategies and TAC recommendations would also be discussed.Thereafter the planning process involved in control of malaria at district level along with the planning process outlined in the training capsule will be discussed in minutest details with DMOs.

After all these discussions practical exercises in respect of formulation of plans at District level for control of malaria shall be undertaken by the District Malaria Officers. This will sensitize the DMOs to the process of formulating a viable and comprehensive plan with the

World Bank assistance ensuring sustainability of the adopted strategies after the World Bank assistance is over. With the acquired knowledge, field experience of the implementing strategies with specific reference to bottlenecks and detailed interactions, it is expected that after these two days workshop the District Malaria Officers will be equipped with necessary background for making practical, feasible and viable plan for their district including community involvement. The purpose of involving Programme Officers, Directors of Health Services and State Health Secretaries is to sensitize them to the issues of malaria control in tribal areas including community participation.Also to seek their intervention to ensure that administrative bottlenecks do not hamper the activities.

The workshop would be organised separately for each State preferably away from the State Headquarters so as to ensure uninterrupted participation of the State level officers. These activities in the 7 states are expected to be completed in 2 months time.

c) Drafting of District Action Plan and workshop

After the briefing, each DMO will have an outline of District Plan including community involvement strategies. He will utilise the data available at the District Headquarters and findings from the beneficiary assessment needs and health delivery studies. The DMO will involve the PHC Medical Officers and State Malaria officers in preparation of the draft action plan.

The plans thus formulated will be discussed in a 5 days workshop for feasibility, covering operational, technical, logistic and sustainability aspects. The Action Plan will be reviewed by the resource persons, Officers from the Directorate of NMEP, Regional Director, Directorate of Health Services and State Health Programme Officers. The 7 resource persons who were involved in making training capsule will actively participate in this process. These deliberations of 5 days duration will also include the selection of pilot districts to test the drafted action plan.

d) Orientation of PHC-Medical Officers of the sample PHCs

Pilot studies of the drafted district action plan will be carried out in 2 districts and in 2 PHCs of these district.The PHC-Medical Officers will be oriented to the action plan by the staff of NMEP along with the District Malaria Officers at the district headquarters.The members of District Malaria Action Team consisting of i) Malariologists ii) Social Scientists and iii) liaison worker will also undergo training and told of specific job responsibilities.This will be of 2 days duration.

Component 3. Piloting the drafted District action plan

Once the operational Plan has been worked out, these plans would be field tested by implementing them on the ground. Out of 635 PHCs in 87 districts by sampling procedure, 14 districts would be identified. However, in

each of the identified districts 2-3 PHCs (with an estimated population of 100,000) would be covered.

All the activities enlisted in the Action Plan including the community involvement will be implemented in toto by MALARIA ACTION TEAMS (MAT).A MAT would comprise 1)Malariologist 2)expert in community organisation/ participation - social scientist and 3) a liaison worker. Every component of each activity shall be closely monitored. Active co-operation of the community leaders,Panchayat and other agencies involved in health and developmental activities would also be sought.The PHC-Medical Officer will be closely involved along with MAT. The common areas of interest amongst different agencies as well as the areas of activities where duplication of efforts are being undertaken will be identified.

The MAT will work for an year in the study PHCs.They will contact the tribal population, discuss the malaria action plan and apprise them of the preventive actions available for malaria control.MAT should be able to identify areas for malaria control which the tribal can do by themselves as this will ensure their participation in the project.

To ensure unbiased technical supervision and opinion, these activities shall be monitored by a Consultant who shall remain stationed in the area of operation for the entire period of implementation. The Officers of Directorate of NMEP will also oversee these activities in all the field areas for a week every month. The field trial

will run for one year during which the performance of various components of the implementing strategy will be closely monitored and fall outs and bottlenecks will be properly identified and possible remedial measures shall be undertaken on the field itself.

The validity of the implementation strategy including positive and negative aspects will be assessed on the basis of identified performance indicators like Annual Blood Examination Rate (ABER), Slide Positivity Rate(SPR), Slide falciparum Rate (SfR), change in the malaria endemicity, etc. Operational indicators like spray operations, time-lag between the episode of fever and treatment received, deaths, if any, shall also be utilised.The findings of this field trial in relation to various indicators available in the existing MIS would also be compared during the corresponding period of the previous three years.

Drafting of the State Action Plan and Workshop

The entire data generated during the feasibility studies will be scrutinised with specific reference to operation plans, strategies adopted to implement various activities as well as operational and manpower logistics. All these would be evaluated with reference to identified technical and operational parameters. These activities will be undertaken in a Workshop of 5 days duration which will be attended by Officers of NMEP, all the District Malaria Officers(DMOs) and the Consultants. The bottlenecks, the constraints of the adopted strategies and the remedial

measures will be discussed in detail. Concerned officials from various allied sectors like ITDA, ICDS, MRC, VCRC, NIHFW, AIIH&PH, NGOs etc. will also be invited to ensure intersectoral co-ordination.

Based on the findings of the field study and discussions of this workshop a flexible, viable, sustainable, cost effective model plan adopted to local conditions and local needs for each State will be formulated.

Proposal of Malaria Control Project in Tribal areas for World Bank financing

The formulated plans in respect of all the 7 States will be reviewed at the Directorate of NMEP along with the Consultants, experts and Officials of Ministry of Health so as to formulate single document for World Bank. The document would include the recommended common strategies for all the States and shall also bring out the areas in which different strategies are required to be implemented for control of malaria.

Appendix-5A

IEC STRATEGY FOR NATIONAL MALARIA ERADICATION PROGRAMME

1. Introduction

Health Education is a part of the success of any Health Programme. Information Education and Communication (IEC) plays an important role in bringing down the disease to a low level. In terms of Malaria, Health Education serves two purposes(i) to inculcate individual/ community protective & preventive habits as a part of malaria control measure within a given socio-economic & environmental context and (ii) to generate a demand for appropriate services from the health delivery system.

In the changing circumstances of epidemiology of diseases, and the environment, a broad strategy for Health Education activity is given below :

2. General Objective

To create awareness among the members of the community about the causes, prevention, treatment and management of malaria cases leading to the reduction in the mortality and morbidity (mortality-nil and morbidity 0.5 cases per 1,000 population per annum)

3. Specific Objectives

3.1 To create awareness on the reduction in the

frequency of the contact between man and mosquito.

3.2 To create awareness among the masses regarding methods which bring about reduction in the parasite load in the community.

3.3 To create awareness on the methods which can bring about reduction in the mosquitogenic condition leading to the lowering of the mosquito density in the area.

The following strategy is suggested :

4. Strategy

4.1 Provider - Faculty of Regional Family Welfare Training Centres and State Health Education Bureaux

4.2 Receiver - School children, Housewives, Mahila Mandals, Villagers, Small factory workers & different members of community.

* The involvement of community opinion and non-formal leaders will be of paramount importance in spread of awareness on malaria in community and in obtaining their co-operation in implementation and acceptance of control activities.

5. Mix Media

5.1 Mass Media : Through electronic media like T.V., Radio, Video quickies, Video on wheels & Cables

5.2 Print Media - Posters, folders, hand bills, charts, flip charts, flip booklets, stickers, book markers for school children, postal prints, etc.

5.3 Other Media- Through Exhibition, Folk dance, Puppet show, Drama, Bhajan, Kirtan, Prabhat fary, etc.

6. Responsibilities

6.1 Centre level

* Press release.

* Release of Malaria books

* Holding of Seminars

* Panel discussions on AIR & TV

6.2 State level

* The same activities above will be carried out at State level.

6.3 Peripheral level

* Poster competition, essay competition

* Organisation of exhibition at school level

* Hoardings and banners at Melas (Carnivals)

* Clay models depicting malaria vector, life cycle, DDT spray, treatment, etc.

* Observation of ' Malaria Week' form 1st May to 7th May every year throughout the country for creating awareness among masses and seeking community participation. (The guidelines for observing 'Malaria Week' are given in Appendix-5B)

Appendix -5B

Observation of Malaria Week - Guidelines

Introduction

The recent resurgence of malaria in many parts of the country necessitated to strengthen our health promotion component of the programme. Therefore, it has been decided to observe 'Malaria Week' before the onset of monsoon. The main objective is to create an awareness among the masses about this man-made disease (malaria) and its prevention. The health education is an integral part of the success of every public health programme. The success of the programme depends upon the community participation. With the above objective in mind the Directorate of NMEP formulated guidelines for malaria week for mass participation in the programme.

Malaria Week:

1st May to 7th May every year has been earmarked as the observation of "Malaria Week" throughout the country. These days have been chosen,because it is the pre-monsoon period and the transmission of mlaria starts around this period in most parts of the country.

Broad Guidelines

Implementing Agencies:

1. NMEP Headquarters, Delhi in collaboration with CHEB.

Nodal Officer i/c IEC, NMEP.

2. State Health Directorate through: (a) State Health Education Bureau (b) NGOs.

Nodal Officer - State Programme Officer.

3. Regional Directors of each State/Region.

The Main Activites:

1. At Central Level -Press release

- Messages from Prime Minister,Health Mininster, etc.

- Holding of Seminars, Panel discussions.

- Release to Press, TV and Radio

- Discussions on TV amd Radio.

- Holding Exhibition on Malaria and other vector borne diseases.

2. At State Hqr. Level - The above activities should be carried out at State level in similar manner.

- Mobilisation of State Health Education Bureau for helping the peripheral agencies.

- Encourage the NGOs to observe the week.

3. Peripheral Level -

a) In health Institutions:

i) Medical Colleges- Lecture-discussion amongst teachers and students (through PSM Deptt. and students).

ii) Distt. Hqrs. Hospitals:

- Estblishment of case detection cum treatment camp. Fever treatment, examination of blood.

- Display of Posters and Banners.

iii) At PHC Level:

- Special camps.

Organisation of meetings with village leaders and impressing about the prevention of malaria.

- Display of Posters and Banners.

- Organising group discussions.

b) In Schools:

- Poster competition organisation of exhibition

- Essay competition.

c) In Block/Taluk Level

- Organisation of camps of opinion leaders

- Meeting with Mahila Samitis and Youth Clubs

- Youth clubs may organise street plays or puppet shows.

A detailed report of observation of 'Malaria Week' should be submitted to the Dte.of NMEP after the week is over.

Appendix-5C

Proposed Budget on Health Education and IEC activities under Dte. of NMEP

1. Printing of Posters on malaria- 2 sets. Size 20x30 cm. with lamination in 13 languages.

Per Set- 2 lacs each

10,000 posters x 11 languages	1.1 Lacs
50,000 " Hindi	0.5 "
40,000 " English	0.4 "
Total requirement	**2.0 Lacs posters.**
Approx. cost	**Rs. 24.0 Lacs**

2. Preparation & Printing of a set of 16 posters (laminated) on malaria for exhibition.

10,000 x 16 sets Hindi	1.6 lacs
10,000 x 16 sets English	1.6 lacs
Total requirement	**3.2 Lacs posters.**
Approx. cost	**Rs. 20.0 lacs**

3. Reprint- Folder on "prevention of malaria" - 4 pages in 13 languages.

10,000 copies x 11 languages	1.1 lacs
20,000 copies x Hindi	0.2 lacs
30,000 copies x English	0.3 lacs
Total requirement	**1.6 lacs folders**
Approx. cost	**Rs. 2.4 lacs**

4. Reprint - Folder on "Prevention for pregnant women"-4 pages in 13 languages.

10,000 copies x 11 languages	1.1 lacs
20,000 copies x Hindi	0.2 lacs
30,000 copies x English	0.3 lacs
Total requirement	**1.6 lacs folders**
Approx. cost	**Rs. 2.4 lacs**

5. Reprint- Folder in " What to do" in malaria -2 pages each 13 languages.

10,000 copies x 11 languages	1.1 lacs
20,000 copies x Hindi	0.2 lacs
30,000 copies x English	0.3 lacs
Total requirement	**1.6 lacs folders**
Approx. cost	**Rs. 1.6 lacs**

6. Reprint - Folder on " A Few Steps to Control Malaria" - one page each in 13 languages.

5,000 copies x 11 languages	0.55 lacs
5,000 copies x Hindi	0.05 lacs
5,000 copies x English	0.05 lacs
Total requirement	**0.65 lacs folders**
Approx. cost	**Rs. 0.50 lacs**

7. Reprint - Pamphlet on "Do's & Dont's on Malaria" - one page each.

10,000 copies x 11 languages	1.1 lacs
20,000 copies x Hindi	0.2 lacs
30,000 copies x English	0.3 lacs
Total requirement	**1.6 lacs pamphlets**
Approx. cost	**Rs. 1.20 lacs**

8. Printing of Handbook on "Treatment of Malaria, National Drug schedule and Treatment of Complicated Malaria" for Medical Officers 10 pages.

5,000 posters x 11 languages	0.55 lacs
50,000 copies each in English & Hindi	1.00 lacs
Total requirement	**1.55 lacs**
Approx. cost	**Rs. 2.50 lacs**

9. Printing of Diary cum Hand-Book on malaria for DDCs, Health Workers and FTDs. -10 pages each.

10,000 copies x 11 languages	1.1 lacs
20,000 copies x Hindi	0.2 lacs
30,000 copies x English	0.3 lacs
Total requirement	**1.6 lacs**
Approx. cost	**Rs. 3.75 lacs**

10. Training course on IEC activity of 5 days duration for Programme Officers at the following Centres.

a). **Shillong or Guwahati:** For N.E. States, West Bengal, Sikkim and A & N Islands.

b). **Lucknow:** U.P, Bihar, Rajasthan, Punjab, Haryana, Himachal Pradesh, J & K, Delhi and Chandigarh.

c). **Bhopal/ Pachmari:** Madhya Pradesh, Orissa, Maharashtra, Gujarat, Daman & Diu, Dadra and Nagar Haveli

d). **Hosur:** Karnataka, Andhra Pradesh, Tamil Nadu, Pondicherry, Kerala and Lakshadweep.

Approx. expenditure **Rs. 21.50 lacs.**

11. Printing of slogans through postal Deptt. in different languages on Postal stationery- Post Card, Inland letter.

Approx. cost. **Rs. 4.0 lacs.**

12. Purchase of Health Education equipments & material.

a). Projection system. (List of compatible equipments)

* Screening set (Lit-pro 550 video projection) - **One**

* Laptop computer(486 with 300 MB 66 MZ 8 MB Ram with super VCA & microsoft mouse) **- One**

* Personal computer (486 with 300 MB, 66 MZ, 8 MB Ram with mouse) **-Two**

b). Laser Printer **- One**

c). Deskjet- Hp-1200 C coloured printer - WAX colour **- One**

d). Digitiser **- One**

e). Scanner - coloured IBM **- One**

Approx. cost **Rs. 20 lacs**

13. Production of video film on:

a). Prevention from mosquito bite.

b). On presumptive treatment on malaria.

c). Methods to reduce mosquitogenic conditions in rural & urban areas.

Approx. cost **Rs. 6.0 lacs.**

14. Telecasting charges of video spots on Doordarshan

Approx. cost **Rs. 6.0 lacs.**

15. Preparation & development of IEC module on Malaria by CHEB.

Approx. cost **Rs. 2.25 lacs**

16. Production & development of illustrated guide for Multipurpose Workers.

Approx. cost **Rs. 2.25 lacs**

17. Observance of 'Malaria Week'.

Approx. cost **Rs. 15.0 lacs.**

18. Purchase of Booklets on:

a). Management & treatment of severe & complicated falciparum malaria.

b). Malaria - Brochure for Medical Officers.

Approx. cost	**Rs. 1.44 lacs**

19. Contingencies :

Expenditure for despatch of H.E. materials to States

CHEB	0.50 lacs
NMEP	0.50 lacs
Approx. cost	**Rs. 1.00 lacs.**
TOTAL BUDGET	**Rs. 137. 79 Lacs**

Appendix-6A

TRAINING NEEDS

Training is required from the grassroots level worker to the programme officer. The load of training required at different levels is given as under. The budgetary and other details are given in the Appendix-6B.

1. FTD/DDC HOLDERS AND LINK WORKERS

The present strategy of malaria control envisages full involvement of the community for successful implementation of control measures. FTD/DDC holders and link workers hailing from the local community are to be deployed in tribal and difficult areas. With the decentralization of malaria control, the revival of Drug Distribution Centres (DDCs) and Fever Treatment Depots (FTDs) and establishment of new ones are planned for early detection and prompt treatment (EDPT) to prevent mortality due to malaria and reduce morbidity. It is estimated that about 7,50,00 voluntary workers are to be imparted one day training in the respective Primary Health Centres on the basic aspects of community participation/ co-operation in spray, early detection of fever and blood smear collection, prompt treatment with full dose of antimalarials, personal and community protection measures, etc. The medium of instruction will be the local language. The participants are to be given monetary incentive to partake in the training. It is proposed to give a stipend of Rs.50 per participant and Rs.100 as hono-

rarium to each of the three faculty members. Each batch may comprise of about 30 members and thus 25,000 batches are to be trained, spread over five years; giving priority to highly endemic and problematic PHCs at the first instance. In those PHCs where class room facilities are not available, school premises could be utilized for training during weekends.

2. MULTIPURPOSE WORKERS.

Multipurpose Worker is the grassroots government functionary who shall require professional skills in IEC, supervision in the indoor residual spray operations, detection and treatment of malaria cases promptly, refer complicated cases to the referral centres and keep vigil whether ***Plasmodium falciparum*** infection is amenable to chloroquine. It is planned to impart two day training at the respective PHCs on the requisite skills. There are 1,50,000 MPWs in the country. Each batch of trainees may comprise of 25 MPWs and 6,000 batches in 5 years @ 1200 batches per year are to be trained. It is proposed to give a stipend of Rs.100 (i.e. Rs.50 per day) per MPW and Rs.200(i.e. Rs.100 per day) to the each of three faculty at the PHC. The training period could be matched with the periodic visits of MPWs so that the TA could be met from the regular budget.

3. MALARIA OR HEALTH INSPECTOR/SUPERVISORY STAFF

One supervisor earmarked for malaria control activities in each of the PHCs is to be trained for two weeks on the planning, implementation, concurrent and consecutive supervision of spray operations, examination of backlog blood smears during non-spray period, monitoring of detection and treatment of malaria cases, logistics, evaluation, etc. at one of the training centres such as ROH&FW, RFWTC, CML, Zonal Training Centres, etc. Each participant may be given a fixed stipend of Rs.800 for the full attendance during the training and the faculty be given an honorarium of Rs.100 per day subject to a maximum of five faculty per working day. In total 1000 batches in five years @ 200 batches per year and each batch having 25 participants are to be trained. Provision for TA is also made in the proposal.

4. LABORATORY TECHNICIAN/MICROSCOPIST

One laboratory technician involved in malaria work in each PHC will be imparted four weeks practical training on blood smear collection, processing, staining, stain preparation, differential diagnosis,. etc. at the well equipped training centres like the one already mentioned for malaria inspector. It is proposed to give Rs.1600 stipend to each of the trainees for full attendance and Rs.100 honorarium to the faculty per day with a maximum of five faculty per working day. In total 1000 batches in five years @ 200 batches per year and each

batch having 25 trainees are to be imparted training. TA is to be met from the present proposal.

5. MEDICAL OFFICERS OF PRIMARY HEALTH CENTRES

Medical Officer of PHC holds a pivotal role in the implementation of the programme. In the decentralized strategy the MO is responsible and accountable for proper implementation and monitoring of the programme. He is to be acquainted with the roles and responsibilities in the supervision of early diagnosis and prompt treatment, anti-mosquito measures, intersectoral co-ordination, community participation, training of grassroots level workers, etc. It is proposed to impart 6 day training at one of the training centres mentioned under Inspector and Technician. Each participant may get fixed stipend of Rs.700/- for full attendance and the faculty to be given an honorarium of Rs.100 per day per faculty limited to the maximum of five faculty members per working day. It is suggested that the training may be given from Monday to Saturday. In all 1000 batches in five years @ 200 batches per year are to be trained and each batch may have an average of about 25 participants. The TA is to be met from the present proposal.

6. DISTRICT LEVEL OFFICERS LIKE DMO/DY. CMHO, ETC.

The district officers are to plan, manage, monitor and evaluate the programme in the entire district. They are to be imparted principles of planning, modern management techniques, intersectoral co-ordination, IEC, MIS, Epidemiology, field operational research, educational technology. It is proposed to impart four weeks training to four district officials in each district at premier institutions like the National Institute of Communicable Diseases, Delhi, MRC, RMRCs and other training centres under ICMR, Institute of Vector Control and Zoonosis, Hosur, Tamil Nadu and some selected medical colleges and bio-medical research institutions. In total 1875 officials are to be trained in 75 batches in five years @ 15 batches per year. A stipend of Rs.4000 is proposed per participant for full attendance and the faculty may get an honorarium of Rs.200 per day with the limitation of five faculty for working day.

7. ZONAL ENTOMOLOGISTS/BIOLOGISTS INCHARGE OF UMS/NFCP

Zonal Entomologists/Biologists have to perform very specialized duties in their respective fields. There are about 500 professionals under these cadres in the country. They will be imparted training similar to district level officers but special emphasis will be given on entomological techniques, dynamics of transmission, etc. The training will be for four weeks. The stipend to partici-

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pants, honorarium to faculty and the type of training institutions are similar to those mentioned under District level Officers. Every year four batches will be trained.

8. TRAINERS' TRAINING

The trainers in the training institutes need to be acquainted with the basic tenets of pedagogy. They should update their knowledge and skills through continuous education and exposure. It may neither be feasible to employ large number of faculty specially for training alone nor possible to develop versatile expertise among the limited members of permanent faculty at the training centres. It is prudent to supplement the training needs by deploying guest faculty possessing expertise in the specialized fields from outside the programme. It is very advantageous to locate the training centres near medical colleges/research institutions/other training institutions to induct the guest lecturers from such organisations. The identified faculty within and outside the health sector requires to be acquainted with the demands of the National Malaria Control Strategy. It is proposed to hold two trainers' training workshops for five days duration at NICD/NMEP per year to train 50 to 60 trainers every year. Since the trainers are senior faculty and most of them are entitled to travel by air, it is proposed to earmark Rs.2 lakhs per workshop. The per-diem per participant and honorarium for resource persons shall be Rs.200 per day and the total faculty shall be limited to a maximum of five per working day.

9. INTERSECTORAL TRAINING

Any talk on intersectoral co-ordination will be a futile exercise unless the professionals within and outside the health sector are imparted training to highlight that their nature of job may impinge on the environment in the proliferation of vector borne diseases.

Training and education on vector borne diseases and the bio-environmental control measures shall be imparted to engineers, and other officers in-charge of developmental projects, public works, irrigation, water resources, forestry, environment, fisheries, railways, agriculture, mining, communication, etc. through specially designed workshops, brochures and manuals. It is proposed to hold one workshop every year in bigger States and one workshop in five years in smaller States/ Union Territories. The workshops shall be for three days with the second day for field visit to developmental project areas to study mosquitogenic conditions and undertaking naturalistic or integrated methods of control. A few workshops have already been conducted by the Dte. of NMEP in Maharashtra, Karnataka, Gujarat, Rajasthan and UP. The outcome of the workshops has been very encouraging. It is proposed to earmark Rs.50,000 for each workshop. The stipend per participant will be Rs.400/ for the entire period of workshop and the faculty may get an honorarium of Rs.200 per working day limiting to five faculty per working day. Twenty workshops are proposed to be conducted every year.

10. INSTITUTIONAL STRENGTHENING OF TRAINING CENTRES

The basic prerequisites of a training centre are the location of the centre in an ideal environment with infrastructural facilities like adequate space, ideal class room fitted with modern teaching aids, well equipped laboratory, insectory, animal house for experimental malaria, a computer for information storage and retrieval system, library with full spectrum of books, periodicals and scientific journals on malaria and other vector borne diseases, adequate transport facility for field visit, a good hostel for boarding and lodging for participants and visiting faculty and above all a highly proficient team of trained teachers.

The operational research should be an integral part of the training centres to gain firsthand information on different aspects of malaria and other vector borne diseases, to evaluate skills through experimentation and also to record any change in the approach that may be warranted from time to time. The research activities confer unique opportunities to augment the technical skills of trainers who in turn transmit the same to trainees. The technical problems faced by the field staff could be taken up by the training centres to evolve solutions through field studies. The operational research should include feasibility studies on alternative methods of control, different diagnostic techniques, screening methods, chemotherapeutic trials, evaluation techniques, IEC activities for community participation,

cost-effective analysis, human behaviouristic patterns, etc.

Though many of the premier training centres in the country do possess infrastructural facilities for the above cited activities, the funds are inadequate to meet the training demands.It is proposed initially to strengthen the Dte. of National Malaria Eradication Programme, Delhi, the National Institute of Communicable Diseases, Delhi, Malaria Research Centre, Delhi and Institute of Vector Control and Zoonosis, Hosur with additional funds of Rs.25-50 lakhs to each of these four organisations. The ROH&FWs (17) and training organizations in the 26 States and 6 Union Territories may be strengthened with additional funds of Rs.10 lakhs each.

11. CURRICULUM

The training curriculum differs for different categories of field staff taking into consideration the nature of their roles and responsibilities. The topics need to be updated due to periodic changes made in the strategy of control on account of rapid technological strides. The curriculum for the top echelons should include subjects inculcating sound knowledge and perception in the managerial skills, planning, budgeting, logistics, financial and administrative rules, evaluation of programme, latest knowledge on different control methodologies, biology of vectors as well as parasite, etc. The curriculum should be balanced properly for each tier of workers covering vast array of instructional materials and methods through lecture-discussions, practical-demonstra-

tions, field exercises, films, slides, charts, models, books, programmed lecture notes, group and panel discussions. The stereotyped notes and monotonous lectures are to be replaced by the modern teaching methods. The skills produced through the training programmes should be upgraded and utility based. The skills produced once are to be constantly updated through continuous interaction between the trained workers and training institutions.

12. CONSULTANTS

It is proposed to appoint two consultants, one having expertise in medical sciences and other experienced in medical entomology and control methodology. These consultants will assist the Dte. of NMEP in developing different training modules and carrying out pilot training courses with the newly developed strategy and methodology. Remuneration @ Rs.12,000 per mensum is proposed to each of the two consultants with adequate provision to meet TA and DA for pilot training courses. Secretarial assistance to the consultants will also be provided from the training funds.

13. TRAVEL AND PER -DIEM FOR DTE. NMEP AND ROH & FW

Travel and per-diem is provided for the officers and consultants of Dte. of NMEP and 17 ROH&FWs @ Rs 2,00,000 per annum to each organisation for helping the

Districts and PHCs in conducting the relevant training courses. The TA and per-diem will be proportionately adjusted for Dte. of NMEP and ROH&FWs depending upon the quantum of training and travel expenses.

14. TRAININGS UNDER HEALTH EDUCATION PROGRAMME

A separate proposal for training of Health Education professionals is annexed.

APPENDIX-6B

EXPENDITURE FOR TRAINING PROGRAMME IN MALARIA CONTROL FOR DIFFERENT TIERS OF PERSONNEL & INSTITUTIONAL STRENGTHENING : 1995-2000

S.No.	Category of staff to be trained	No. to be be trained	No. of Batches to be trained	Name of the Training Inst.	Period of Trng.	Expenditure per batch	Expenditure (Rs. in Crores)					Total for 5 yrs.
							1995-96	96-97	97-98	98-99	1999-2000	
1.	Village volunteers of DDC/FTD	7,50,000	5,000	PHC one each per year	1 day	Rs. 2,500	1.25	1.25	1.25	1.25	1.25	6.25
2.	Multipurpose Workers	1,50,000	1,200	PHC/CHC one each per year	2 days	Rs. 5,000	0.60	0.60	0.60	0.60	.60	3.00
3.	Laboratory Technicians/ Microscopists	25,000	200	ROHFW/State/ zones	4 weeks	Rs. 75,000	1.50	1.50	1.50	1.50	1.50	7.50
4.	Supervisory Staff/Malaria Inspectors	25,000	200	ROHFW/State/ ZONES	2 weeks	Rs. 50,000	1.00	1.00	1.00	1.00	1.00	5.00
5.	Medical Officers PHC	25,000	200	ROHFW/State/ Medical College	1 week	Rs. 50,000	1.00	1.00	1.00	1.00	1.00	5.00

6.	District level officers/DMO/ Dy. CMHO etc.	1,875	15	NICD/MRC/IVCZ	4 weeks	Rs. 2,50,000	0.375	0.375	0.375	0.375	0.375	1.875
7.	Zonal Entomologists/ Biologists of UMS	500	4	...	4 weeks	Rs. 2,50,000	0.10	0.10	0.10	0.10	0.10	0.50
8.	Trainers' Training	250	2	NMEP/NICD	1 week	Rs. 2,00,000	0.40	0.04	0.04	0.04	0.04	0.20
9.	Workshops for intersectoral co-ordination for Bio-environmental control	3,000	20	Zones	3 days	Rs. 50,000	0.10	0.10	0.10	0.10	0.10	0.50
10.	Training consultants at the Dte. of NMEP with Secretarial Asst.	2 consultants & secretarial assts.					0.25	0.05	0.05	0.05	0.05	0.05
11.	Travel & per-diem for Dte. NMEP & ROHFWs					Rs. 2,00,000 each	0.36	0.36	0.36	0.36	0.36	1.80
12.	Institutional strengthening											1.50

i)	NMEP/NICD/MRC/IVCZ	1.70
ii)	ROHFWs	3.20
ii)	States/Uts	.....
	Total	6.40

APPENDIX-7

MALRIA CONTROL STRATEGY IN EPIDEMIC PRONE AND TRIBAL AREAS UNDER THE INFLUENCE OF DIFFERENT MALARIA VECTORS

S.No.	Malaria Area	Qualifying epidemio-logical parameter	Disease Management	Intervention Measures (if not specified, to be implemented for two consecutive years)
7.3.1.A.	PLAIN IRRIGATED AREAS (Tube well) low SPR: Eastern Uttar Pradesh like Deoria & ad-joining districts and North Bihar. (Vector ***An. culicifacies*** where sibling species B is predominant)	5.1	-Case detection through FTD, ACD, PCD, -Blood slides collection only from cases having fever. -Presumptive treatment. -Radical Treatment to positive cases. -Priority of R.T. especially in ***Pf*** cases within 48 hours. **Action Required** - Strengthen the PHC infrastructure and referral services as per norms of PHC system -Provide malaria clinics at sub-centre levels. - IEC as per Appendix - 5A & 5B	**-Short term intervention measures** -One round of residual insecti-cide spray with DDT 1gm/sq. metre in selected villages showing disease prevalence of moderate SPR and also ***P. falciparum*** infection. The round of insecticidal spray should be scheduled to cut off peak transmission period. - IEC as per Appedix - 5A & 5B

APPENDIX-7 *(Cotnd.)*

S.No.	Malaria Area	Qualifying epidemio-logical parameter	Disease Management	Intervention Measures (if not specified, to be implemented for two consecutive years)
7.3.1.B.	PLAIN AREAS with sandy soil without waterlogging : High SPR: Madhya Pradesh, Rajasthan and in the parts of districts of adjoining States. (Vector ***An. culicifacies*** sibling species A & C)	5.1	- Same as 7.3.1. A. **Action Required** - create a post of malaria link worker. - Open malaria F.T.D. as given under 7.3.1.A in areas wherever population is sparse per sq. km.	**Short terms intervention measures** Two rounds of DDT 1 gm/sq metre in selected villages only showing high SPR and ***P. falciparum*** infection. -In villages with moderate SPR but with ***Pv*** infection only one round of DDT spray to cut off peak transmission period. -IEC as per Appedix - 5A & 5B

APPENDIX-7 *(Contd).*

S.No.	Malaria Area	Qualifying epidemio-logical parameter	Disease Management	Intervantion Measures (if not specified, to be implemented for two consecutive years)
7.3.1.C	PLAIN DESERT AREAS with high SPR Rajasthan: ***An.culicifacies*** in pockets, Main vector: ***An. stephensi***	5.1	-Case detection through FTD,ACD,PCD. -Blood slides to be examined. -presumptive treatment to all fever cases. -Radical treatment to all cases and ***Pf.*** Cases to be given priority for RT within 48 hours.	**-Short terms intervention measures** -anti-larval measures with temephos in prescribed dosage in water storage tanks every week. Note **Keep watch on vector density build up**

APPENDIX-7 *(Contd).*

S.No.	Malaria Area	Qualifying epidemio-logical parameter	Disease Management	Intervantion Measures (if not specified, to be implemented for two consecutive years)
7.3.1.C (Contd.)		5.1	**Action Required** -As given in 7.3.1.A -Strengthen the PHC infrastructure according to national norms. -Provide malaria clinics at selected sub-centres which are far away from PHC. -FTD: one FTD for 1000 population or part there of if the distance between villages is more than 3 kms. -Link worker: one for 2000 or 4000 population. He should also work as FTD and carry all blood slides of his area to PHC or malaria clinic twice a week. He should also bring replenish-ment of drugs and microslides for FTDs in his area. Note: **Keep watch on parasite reservior build up.**	-In case of threat of an epidemic/early epidemic period all actions as recommended under epidemic control (given in the Guidelines) to be implemented. -Take anti-epidemic measures in selected villages falling under qualifying parameter. -Followed by single round of DDT spray at 1 gm/sq. metre or 2 gm/sq. metre Malathion.

APPENDIX-7 *(Contd).*

S.No.	Malaria Area	Qualifying epidemio-logical parameter	Disease Management	Intervention Measures (if not specified, to be implemented for two consecutive years)
7.3.1.D	PLAIN COASTAL AREAS with high SPR and moderate epidemic potential: Coastal areas of Orissa, Andhra Pradesh & Tamila Nadu (Vector: ***An. culicifacies*** and ***An. annularis)***	5.1	Same as given under 7.3.1. A	**Short term intervention measures** -focal spray irrespective of transmission period in and around the *Pf* households -or focal spray in and around *Pv* households during transmission period. -One round of spray in selected villages with moderate SPR with DDT 1 gm/sq. metre with 80% or above coverage of rooms. -Implement anti-epidemic measures in case of focal outbreak.

APPENDIX-7 *(Contd).*

S.No.	Malaria Area	Qualifying epidemio-logical parameter	Disease Management	Intervention Measures (if not specified, to be implemented for two consecutive years)
7.3.1.D (Contd.)	PLAIN COASTAL AREAS with low SPR where epidemics are unknown: Kerala & other Eastern Ghat plains & foothills. (vector: ***An.culicifacies)*** Note: **Threat due to importation of cases from Gulf countries.**	5.1	-Blood smears to be collected from cases with fever only or migrants from other countries & states with fever cases. -Presumptive treatment to fever cases should be selective (based on local conditions). -Full Radical Treatment to ***Pf*** positives within 48 hours with appropriate anitmalarials. (Some cases from Gulf countries may have resistant ***Pf*** infection)	**Short term intervention measures** -Focal and other remedial measures around ***Pf*** cases.

APPENDIX-7 *(Contd).*

S.No.	Malaria Area	Qualifying epidemio-logical parameter	Disease Management	Intervention Measures (if not specified, to be implemented for two consecutive years)
7.3.2.A.	UNDULATING HILLS/ FOOTHILLS areas with riverine belts and perennial water sources, high SPR. Areas like foothills in Himalayan region, Assam W.Bengal, Eastern Ghat & Indian peninsular Hills/ Foothills. Vectors: **a) *An.culicifacies*** ***An.minimus*** ***An.fluviatilis*** ***A.dirus.*** ***b) An. culicifacies*** ***An.minimus*** ***An.dirus.***	5.1	Same as given under 7.3.1. A	**Short term remedial measures** 2 rounds of DDT 1 gm/sq. metre in all villages of PHC qualifying under criterion **-A Selective third round in a few villages with epidemic potential** with DDT 1 gm/sq metre. Note: **Coverage of rooms should not be less than 80% and spray schedule tailored to curtail the local transmission period.**

APPENDIX-7 *(Contd).*

S.No.	Malaria Area	Qualifying epidemio-logical parameter	Disease Management	Intervention Measures (if not specified, to be implemented for two consecutive years)
7.3.2.B	MALARIA IN ORGANISED SEC-TOR /ARMY/BSF/ BORDER ROAD ORGANISATION and TEA GARDENS Vectors : ***An. culicifacies-*** ***An. minimus*** ***An. dirus***	5.1	-Compulsary screening of labour -Blood Smear collection through ACD, PCD & FTD. -Blood smear examination -Presumptive & Radical treatment of all postive cases with priority to ***Pf*** infection within 48 hours. **ACTION REQUIRED** -Establishment of FTD -Establishment of infrastructure for ACD -Strengthening of referral Hospital/ Dispensary. -Establishment of malaria clinic -Establishment of malaria link worker.	**Short trem Intervention measures** -Selective spray with DDT or Organophosphorus compounds in villages/with high SPR; 2 or 3 rounds of spray depending upon the length of transmission period -use of personal protection such as impregnated bednets, etc,

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